Cisco's storage surprise

The company is said to be readying a top-of-the-line director-class switch. **PAGE 8.**

En garde!

Amid growing concern about hacker infiltrations into military computers, the top commander for the Department of Defense network operations is stepping up security. **PAGE 8.**

Locking up Linux

Vendors behind the major commercial Linux distributions, including Red Hat and Novell, will be increasing their security efforts in the coming months. **PAGE 16.**

NETWORKWORLD

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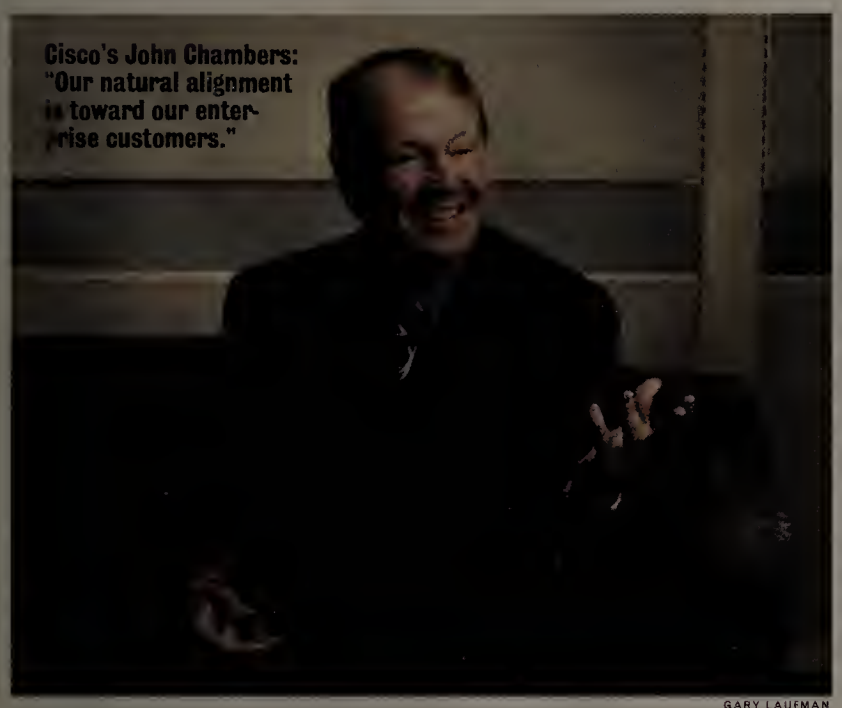
January 16, 2006 ■ Volume 23, Number 2



Cisco's John Chambers: "Our natural alignment is toward our enterprise customers."

GARY LAUFMAN

Chambers defends Cisco's wide reach

Q&A Cisco is stretched in many directions, with big initiatives in the enterprise, service provider, consumer and small to midsize business markets. Add to this the company's $7 billion purchase of Scientific-Atlanta, and it's a plateful. Network World *Editorial Director John Gallant and Managing Editor Jim Duffy met with President and CEO John Chambers last week to talk about why Cisco's reaching so far and how its moves will affect corporate customers.*

Can you rank your four lines of business in order of strategic priority and growth prospects?

We think the enterprise network, the commercial/SMB network, the consumer network and the service provider network will completely blur. We've

See Chambers, page 12

Nortel road map stresses security

BY PHIL HOCHMUTH

Nortel next month is expected to start revitalizing its enterprise switching business by introducing a new endpoint security product, which may be followed by a series of LAN resiliency and security announcements throughout the year.

The new Secure Network Access Switch (SNAS) is an appliance that works with LAN switches to block or quarantine potentially dangerous devices without requiring permanent client software on PCs, laptops or other devices. Observers say this clientless approach gives Nortel a competitive multi-vendor network access control (NAC) offering.

"Nortel needed to do something like this," says Zeus Kerravala, an analyst with The Yankee Group. After a turnultuous year of executive shakeups, laying out a switching road map with a focus on security should help — at least somewhat — to eliminate concerns about the vendor's enterprise intentions.

Additional announcements expected from Nortel include the ability to run full Check Point firewall or Sourcefire intrusion-detection system (IDS) and intrusion-prevention system (IPS) packet inspection on every port on core Nortel switches. Also planned is near-SONET-speed failover for switches with Nortel's redundancy protocol, Split Multi-Link Trunking, as well as added support for SMLT across more product lines.

Nortel's SNAS — in beta and set

See Nortel, page 10

On tap from Nortel

LAN product and feature upgrades expected in '06 include:

- LAN-based endpoint security.
- Switch port-level firewall/IDS.
- SONET-speed Ethernet failover.
- Wider fast-failover support.

CLEAR CHOICE TEST:

WEB FRONT-END DEVICES

In the industry's first comprehensive test of the performance of Web front-end devices, we found the benefits of app acceleration are real, but there's a trade-off between speed and scalability. **Page 38.**

NETWORKWORLD CLEAR CHOICE

Go online for product-by-product breakdowns for Array, Citrix, Crescendo Networks, F5 Networks, Foundry Networks and Juniper Networks. **www.networkworld.com, DocFinder: 1741.**

A WiderNet

IETF hums along at 20

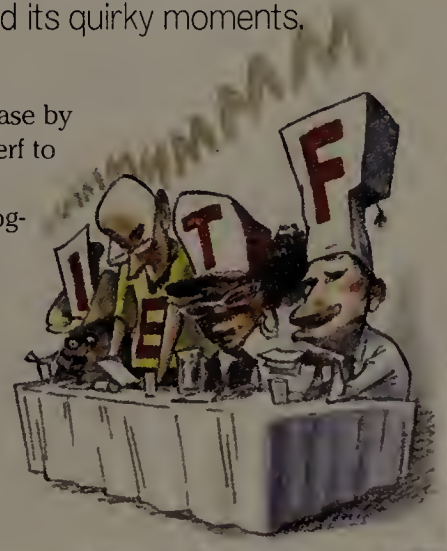
Standards body has had its quirky moments.

BY CAROLYN DUFFY MARSAN

From a notorious striptease by Internet pioneer Vint Cerf to a fist-pumping, table-jumping brawl about cryptography policy, the Internet's premier standards-setting body has had its share of big moments.

This week, the IETF celebrates another one when it turns 20.

See IETF, page 14



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Management Strategies

COOLTOOLS

The Logitech Wireless Music System lets you stream music stored on a PC to any stereo system within a 330-foot radius. Page 34.

Features

Clear Choice Test: Web front-end devices

NETWORKWORLD CLEAR CHOICE

In the industry's first comprehensive test of Web front-end performance, we found that the benefits of app acceleration are real. But there's a trade-off between speed and scalability. **Page 38.**

Test results for compression. **Page 39.**

Test results for TCP multiplexing. **Page 42.**

Go online for product-by-product breakdowns for Array, Citrix, Crescendo Networks, F5 Networks, Foundry Networks and Juniper Networks. www.networkworld.com, DocFinder: 1741

■ **CONTACT US** Network World, 118 Turnpike Road, Southborough, MA 01772; **Phone:** (508) 460-3333; **Fax:** (508) 490-6438; **E-mail:** nwnews@nww.com; **STAFF:** See the masthead on page 12 for more contact information. **REPRINTS:** (717) 399-1900

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Network World ITVideo: Cool Tools on wireless music
Cool Tools Editor Keith Shaw says you can free yourself from the computer and listen to your PC-based music on virtually any stereo in the house — without needing a network — with the Logitech Wireless Music System. Watch his demonstration at:
DocFinder: 1750

Gibbsblog: The myth of the digital lifestyle
Columnist Mark Gibbs is tired of industry execs talking about the wired home. Some readers are, too — because like Gibbs, they want stuff that actually works.
DocFinder: 1751

Chinese domain-name registration
Columnist James Gaskin notices that the number of domain names registered in China has topped 1 million. That makes him both nervous and optimistic.
DocFinder: 1752

Management Notes
A lot happens in network and systems management. Senior Editor Denise Dubie keeps you up-to-date with daily Management Notes posts.
DocFinder: 1753

Online help and advice

When the laptop keeps disconnecting from wireless
Help Desk Editor Ron Nutter helps a user who wonders why his Windows XP laptop keeps getting kicked off his networks.
DocFinder: 1754

Readers check in on the wireless woes
Some of Nutter's readers have their own suggestions. Read them and add your own. **DocFinder: 1755**

Measuring your WAN apps
Analyst Robin Gareiss discusses a new service from Masergy that lets you gauge the performance of applications on your WAN in real time.
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NEWSbits

Claflin to step down as 3Com CEO

3Com President and CEO Bruce Claflin last week announced plans to retire, leaving an open timetable for when he will step down as the company begins the search process for his successor. Claflin joined 3Com as president and COO in 1998 and took over as CEO in 2001. Over the past four years, 3Com has operated in the red, but its losses shrank from $349 million in its fiscal year 2004 to about $195 million in 2005. Claflin has stated that he expects the company to be profitable by 2007. Claflin was largely behind 3Com's pullout from the high-end switching and routing market in 2000. He oversaw the divestment of its carrier business CommWorks and the company's transformation after the dot-com crash into a small and midsize business and consumer-focused network company, with such products as broadband gear and the Audrey Internet-radio appliance. He also helped engineer the company's more recent efforts to reestablish its large corporate market presence, including a joint venture with Chinese network giant Huawei Technologies.

Report: Deal for Cisco and EDS

Cisco and Electronic Data Systems are close to landing a $15 billion network upgrade and outsourcing deal with General Motors, a financial analyst reported last week. Merrill Lynch research analyst Tal Liani issued a report on the potential five-year contract, which would involve the installation and management of new Cisco IP data and voice-network gear by integration giant EDS. Cisco declined to comment. The report says that GM is looking to upgrade to a corporatewide IP telephony infrastructure and to consolidate its data centers with Cisco equipment. The IP voice part of such a contract would be huge for Cisco, Liani writes, as "GM currently has over 200,000 employees in North America. And at a price of around $200 per Cisco IP phone, this implies $40 million worth of revenue simply for upgrading GM's phones." The deal's estimated size also does not account for IP PBX, power-over-Ethernet switches, routers, VoIP gateways and other gear that would be required for such a large-scale project, the report says.

Another storage tape missing

A computer tape from a Connecticut bank containing the personal data of 90,000 customers was lost in transit recently, the bank reported last week. The tape contains information such as names, addresses, Social Security numbers and checking account numbers. It was bound for the TransUnion credit-reporting bureau in Woodlyn, Pa., via UPS. The bank says it has not received any reports of unauthorized activity on the affected accounts and has no reason to believe the data has been used improperly. The bank considers misuse of the data "highly unlikely." Loss and theft of personal data has taken on a high profile since the theft of 145,000 consumers' data from credit and personal information vendor ChoicePoint in February 2005. There have been dozens of reported cases of loss or theft of personal information since, involving more than 52 million people, according to a chronology compiled by the Privacy Rights Clearinghouse.

{quote of the week}
{quote of the week}
{quote of the week}

"We have nation states that have information warfare as one of their key military components. They're after getting into the best network in the world, and that's ours."

Lt. Gen. Charles Croom, director of the Defense Information Systems Agency. See story page 8.

WLAN spec garners agreement

An industry group seeking common ground on the emerging IEEE 802.11n high-speed wireless LAN specification has agreed on a compromise proposal that may form the basis of a final standard. Last week the Enhanced Wireless Consortium, which includes backers of all the major factions in the fight over how to boost the speed and range of WLANs, approved the proposal by a unanimous online vote with two abstentions, according to Bill McFarland, CTO at Atheros Communications, a semiconductor vendor that belongs to the group. The 802.11n standard is intended to be the next step up in WLANs, offering throughput of more than 100Mbps and support for multiple VoIP and video streams. But the road to a standard has been long and rocky. The joint-proposal group was formed in the middle of last year after none of the plans that had been proposed could garner enough votes for approval.

'Google-killer' goes into hiding

A project to develop advanced multimedia search technologies led by France's electronic giant Thomson has gone into hiding in the face of intense publicity that it is building a "Google-killer" that will help to improve Europe's standing in the high-tech world. The project, called Quaero, found itself in the spotlight following remarks by French President Jacques Chirac in a speech laying out his agenda for France in 2006. "We must take up the challenge posed by the American giants Google and Yahoo," Chirac said, discussing the importance of technology to Europe's economy. "For that, we will launch a European search engine, Quaero." There was talk of a coming-out party next month where Quaero's goals would be described in more detail, although a spokeswoman for the project said no event has been planned. The scrutiny was apparently too much for Thomson's chairman, Frank Dangeard, who imposed a "news blackout" on Thomson's media staff and ordered the project's Web site to be taken offline.

TheGoodTheBadTheUgly

IBM remains patent king. The U.S. Patent and Trademark Office last week said IBM last year once again received more U.S. patents than any other company, the 13th straight year this has happened. IBM, which was awarded 2,941 patents, says it is undertaking an effort with the Patent Office and Open Source Development Labs to boost patent quality.

Ex-IBM CEO dies. Frank Cary, who was chairman and CEO of IBM from 1973 to 1981, died Jan. 1 at the age of 85. He led the company during challenging times, dealing with anti-trust lawsuits and rising competition from Japanese firms.

< Cookies crumble at NSA. The National Security Agency last week acknowledged that it accidentally had been using cookies on its site that could be used to track visitors' Web surfing activities, according to the Associated Press. AP reported that the cookies, which the NSA said were the result of a software upgrade, disappeared after a privacy activist complained and the AP made inquiries.

COMPENDIUM

RoboRoaches

Japanese researchers have successfully replaced cockroach antennae and wings with tiny "backpacks," through which they can control the insects' movements remotely. **Find out more at www.networkworld.com, DocFinder: 1749.**

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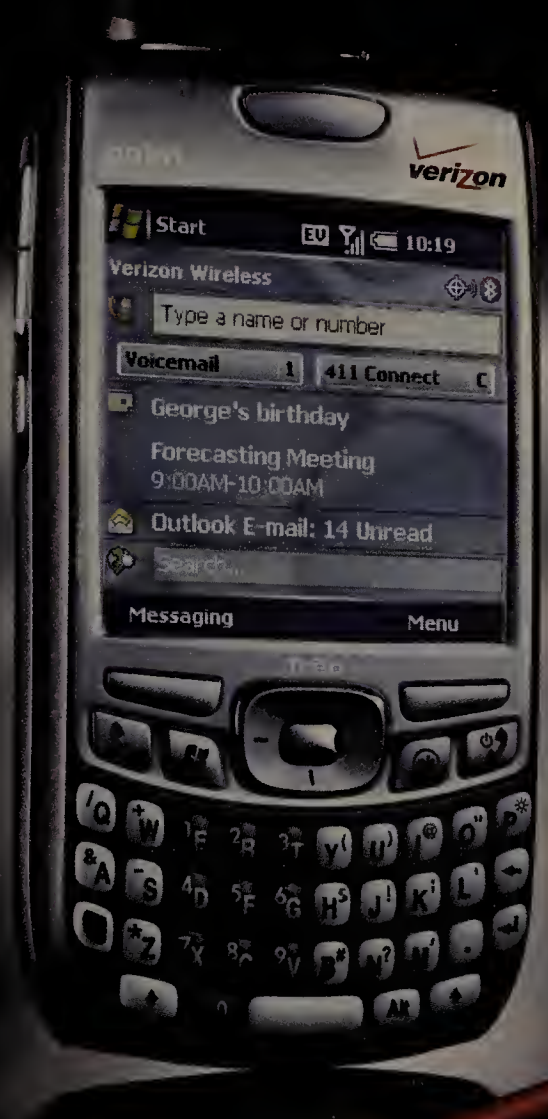

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Military clamping down on security

BY ELLEN MESSMER

PALM HARBOR, Fla. — Amid growing concern about hacker infiltrations into military computers, the top commander for the Department of Defense network operations has ordered a crackdown on security.

Lt. Gen. Charles Croom, commander of the Joint Task Force on Global Network Operations (JTF-GNO)and director of the Defense Information Systems Agency (DISA), last week said a sweep is under way of all Defense Department networks to uncover security holes amid a get-tough policy.

Lt. Gen. Charles Croom is overseeing an overhaul of the Defense Department's networks.

"The attacks are coming from everywhere and they're getting better," said Croom in his keynote address at the Department of Defense Cyber Crime Conference in Palm Harbor, Fla., last week. "They're exploiting weaknesses in our detection tools."

The discovery of a botnet last November in Defense Department networks contributed to the decision to clamp down security. Jeanson James Ancheta, 20, was arrested by the FBI for allegedly implanting and running the remotely controlled spyware inside the department and elsewhere.

"It started on Nov. 5 with an information assurance stand-down day," Croom told the roughly 500 conference attendees. The military stand-down — a cessation of regular activities in order to probe security problems — is ongoing as DISA attempts to verify the tens of thousands of user accounts for Army, Navy and Air Force personnel.

No good news

So far, the results are troubling.

"Almost 20% of our accounts are unauthorized or had expired," Croom said, noting that military personnel tend to move every two or three years and accounts are sometimes left open. The exact tally of improper accounts won't be known until March, he said.

In addition, the military is increasingly fending off targeted phishing attempts in which attackers try to spoof victims into giving up passwords.

Back doors left open by not properly shutting down network circuits also are of concern to Croom, who has held the top job in Defense Department network operations since July, when he succeeded Lt. Gen. Harry Raduege. Croom said the paperwork for circuits must be in order or the circuit will be shut down.

"Last week we closed down four circuits to users," Croom said, though not identifying the exact locations. "Now I get an e-mail saying the paperwork will be in today." This get-tough approach is needed to put teeth into already existing policy.

A united front

The biggest changes to come may be in the next six months as the JTF-GNO, the organization set up to centralize decisions about security and operations in the Army, Navy Air Force and Marines, evaluates a possible redesign of its two primary, global, IP-based, military networks.

The Non-Secure Internet Protocol Router Network (NIPRNet) is used for unclassified communications while the Secret IP Router Network (SIPRNet) is used for classified communications.

"DISA wants to redesign these networks with security as the upfront criteria," Croom said.

The decades-old NIPRNet is a non-homogeneous combination of more than 1,500 networks, Croom said, adding that he helped wire some of it by hand. The SIPRNet has better security at its perimeter but also could benefit from internal partitioning, he said.

One difficulty is that the Defense Department has basically no end-to-end network management, Croom said, adding that he hoped this would be part of the architectural changes under review in the next six months.

In addition to the security crackdown, the Defense Department Cyber Crime Conference highlighted other advances for the department.

The Defense Cyber Crime Center, in Baltimore, which carries out computer forensics work for the military, announced its lab methodologies and standards earned it the accreditation of the American Society of Crime Laboratory Directors (ASCLD), making it one of only six computer forensics labs in the country to hold that distinction.

"This can give the [Defense Department's] leadership the confidence that they have experts in their line of work," said Lt. Col. Kenneth Zatyko, director of the Center's Defense Computer Forensics Laboratory.

A big step

Steve Shirley, executive director of the Defense Cyber Crime Center, said the ASCLD accreditation is an important step because it is valued by the court system when digital evidence is exhibited in a criminal case.

The Defense Department and the Department of Justice also are working together to define possible requirements to certify computer forensics examiners because there is no recognized authority for this type of expert, although a handful of universities now have programs for this position.

"In air flight, the first aviators didn't have a pilot's license," Shirley said. "We're sort of in the same stage of development when it comes to digital forensics examiners."■

Cisco readies storage switch

BY DENI CONNOR

Nearly three and a half years after announcing a high-end storage switch, Cisco says the market is finally ready for it.

Sources say the company, which is already among the market leaders in storage switching, is expected to introduce as soon as April a 528-port Fibre Channel device designed to help companies consolidate their storage-area networks (SAN) and avoid over-subscribing ports on smaller switches. Cisco declined to comment.

The Cisco MDS 9513 MultiLayer Director originally debuted in August 2002 when Cisco said it was getting into the Fibre Channel switch market. But the company decided to hold the then 256-port MDS 9513 off the market because of lack of demand for so dense a switch, a Cisco spokesman says.

"Cisco waiting to do a 4Gbps x 528-port switch makes a lot of sense," says Greg Schulz, senior analyst with Storage IO. "Keep in mind that the 256-port market is just now in prime time."

The switch, in beta test, features 13 slots and 528 4Gbps Fibre Channel ports. It tops Cisco's current high-end offering, a 224-port device, and surpasses McData's 256-port Intrepid 10000 Director. Like Cisco's other Fibre Channel switches, it is expected to support not just Fibre Channel but also protocols such as iSCSI and Fibre Channel over IP. It also will support intelligent storage services such as virtualization, sources say.

The desire to get away from over-subscribing current switches could be a powerful selling factor, observers say.

"Over-subscription makes sense if you can manage and allocate the tiered ports similar to how it is done in the LAN world," Schulz says. "However, it has also been a contentious topic among storage administrators, some of whom have seen it as a cardinal sin in I/O configuration."

SAN consolidation also could generate demand.

"Our move to [128-port] director-class MDS 9509s from the core-to-edge scenario has brought ease of provisioning, ease of use and less complexity to our environment," says Michael Passe, storage architect for Caregroup/Beth Israel Deaconess Medical Center, in Boston. "I would imagine that the MDS 9513 would do the same for people with higher numbers of hosts, who would like to move away from the core-to-edge design they might have used in the past, and consolidate on a single backplane."

Cisco's entry into Fibre Channel storage in 2003 had considerable impact on the director-class market. In the fourth quarter of 2004, barely one and a half years after entering the market, Cisco and McData tied for market share leadership with 32.6%, according to The Yankee Group.■

Sweet on storage

A look at Cisco's key storage moves.

Acquires NuSpeed and its Fibre Channel-to-IP router.	**July 2000**
Introduces SN 5420 Storage Router.	**April 2001**
Introduces SN 5428 Storage Router.	**May 2002**
Introduces Fibre Channel directors and switches.	**August 2002**
Acquires Andiamo, intelligent switch technology.	**August 2002**
*Captures 17.2% of the director-class switch market, up from 0% two years earlier.	**March 2004**
Acquires wide-area file services vendor Actona.	**June 2004**
Partners with IBM to put virtualization on Cisco MDS 9000.	**July 2004**
*Tied with McData for the leading share of the director-class switch market, with nearly 33%.	**December 2004**
Acquires InfiniBand vendor Topspin.	**April 2005**

* Source for market share numbers: The Yankee Group.

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Storing up the switch

Get Senior Editor Deni Connor's opinion of Cisco's move in her blog.

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Symantec, Kaspersky criticized for cloaking software

BY ROBERT MCMILLAN, IDG NEWS SERVICE

The Windows operating system expert who exposed Sony BMG Music Entertainment's use of rootkit cloaking techniques last year is now criticizing security vendors Symantec and Kaspersky Lab for shipping software that works in a similar manner.

Mark Russinovich, chief software architect with systems software company Winternals Software, says the techniques used by Symantec's Norton SystemWorks and Kaspersky's Anti-Virus products are rootkits, a term usually reserved for the techniques used by malicious software to avoid detection on an infected PC.

There is "no good justification," for using such techniques, Russinovich says.

Both Symantec and Kaspersky concede that they have shipped software that hides information from system tools, but told IDG News Service they disagreed with Russinovich's use of the term rootkit. They say because their software was not designed with malicious intent, it should not be lumped into the same category.

Still, both companies appeared to be sensitive to Russinovich's criticism.

Symantec last week issued a patch to SystemWorks that disabled the cloaking feature. And a representative from Kaspersky says it's possible that his company could take similar action.

Unlike Sony's XCP (Extended Copy Protection) software, the Symantec and Kaspersky products do not cloak the fact that certain pieces of software are running on the computer. Instead, they hide data.

Symantec's Norton SystemWorks' PC-tuning software uses cloaking techniques to hide a directory of back-up files. This technique has been employed by SystemWorks since the 1990s to prevent users from accidentally deleting these files, according to the company. ■

Nortel

continued from page 1

for release in mid-February — is a network appliance that attaches to an aggregation-layer switch and controls network access through wiring closet-level switches at the LAN edge.

When a machine accessing a LAN requests an IP address from a local DHCP server, the connection is directed to an SNAS, which authenticates the device and downloads a temporary Java applet to the machine. This software, which deletes itself after logoff, inspects the machine and verifies its anti-virus status and other software profiles (see graphic).

"It's very easy to administer because you don't have to manage clients," says Pat Patterson, director of Nortel's enterprise security solutions group. "Most solutions we've seen that try to use a clientless approach require all traffic to go through an appliance. . . . Our approach won't screw up [a customer's] latency-sensitive traffic by creating that kind of bottleneck."

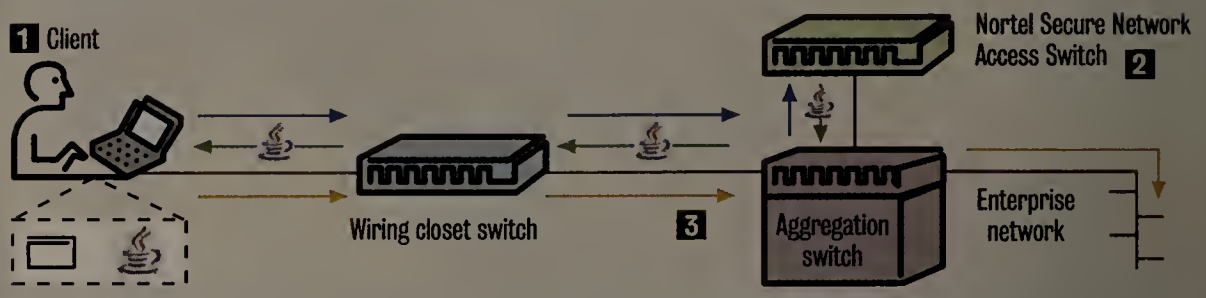
Nortel includes an endpoint security technology with its SSL VPN products, which allows users to scan and block PCs and laptops entering a corporate network through a remote connection. The SNAS brings this capability to LANs.

"We're really interested in locking down Ethernet ports," says Sheng Guo, CTO for the State of New York Unified Court System, which uses Nortel gear in all state-run courthouses and judicial offices. "This is definitely a hole that needed to be filled and something we're looking forward to."

One of the ways Guo's staff secures the network is by turning off unused LAN switch ports. But this is time-consuming and non-exact, he says. "You may be right or wrong — and if you shut down the wrong port, you can cause a lot of headaches." A system that automatically secures every port based on the device attached could help solve this issue, he says.

Nortel's protection plan

Nortel is introducing a network access control (NAC) product designed to block access on infected PCs and laptops without installing permanent software clients on them.



1 A user attaches to the network and is directed to the Secure Network Access Switch (SNAS). Windows-based logon/password information is passed from client to the SNAS. Non-Windows clients authenticate through a Web browser.

2 The SNAS downloads a temporary Java-based applet that inspects the machine and gathers data from locally installed anti-virus clients from other vendors.

3 If the data is verified, the SNAS directs the wiring closet switch to grant access to the network.

nww.com

Closer look

The head of Nortel's Ethernet business dives deeper into the company's 2006 switch plans in a Q&A.

DocFinder: 1761

One SNAS can support as many as 2,000 concurrent network-attached devices — such as PCs and laptops, as well as IP phones, wireless LAN access points and networked printers.

The SNAS will compete with NAC products and systems such as 3Com's TippingPoint-based NAC technology; Alcatel's CrystalSec system; Cisco's Network Admission Control; Enterasys' Trusted End-System Solution; and products from vendors such as Check Point, ConSentry and Lockdown Networks.

Upgrades in the works

Upgrades are also in the works to add line-rate firewall and IPS/IDS features on Nortel's Ethernet Routing Switch (ERS) 8600, introduced last year. An ERS 8600 with a Service Delivery Module — a four-processor blade that can run third-party applications — will be able to run Sourcefire's IPS application in March, says Sanjeev Gupta, director of Nortel's Ethernet Switching Business. The blade currently allows ERS 8600 switches to run Check Point firewall software.

"Customers say they want more integrated security in Ethernet switching in data centers — they don't want to deploy multiple devices for firewall, IPS and other security services," Gupta says.

By the end of the second quarter, Nortel plans to announce an upgrade to the ERS 8600 switch software, as well as processor and memory upgrades that will push Check Point and Sourcefire features down to every port on the switch, Gupta says.

Nortel's Service Delivery Module — similar to application-based modules from Cisco, F5 Networks and others — requires traffic from all ports to travel through a switch backplane to a blade in order to process packets through a firewall, IPS or other applications on a module.

The upgrade will allow Service Delivery Module applications to be physically processed on individual ports. (See a diagram of how this works online at www.networkworld.com, DocFinder: 1760.)

"Now you have distributed processing on every port in the 8600 switch," Gupta says. "Every port can be fully secured." This works by having the session tables created on the Check Point firewall blade pushed down to individual network processors installed on each port on the 8600 line cards.

In another expected release in March, Nortel plans to announce Version 4.1 of its ERS 8600, which includes software and processor upgrades. The upgraded switch will also include a new version of Nortel's SMLT.

This Layer 2 protocol allows Nortel switches to be configured in redundant, high-bandwidth configurations. With standard Layer 2 Ethernet, connecting a single switch with uplinks to two separate switches — or multi-homing — allows only one link to be active. Spanning Tree Protocol is used to detect if one link fails, and then the secondary link is activated after a short delay (up to 30 seconds).

Nortel says SMLT allows both links in a dual-homed setup to be active, while providing sub-second failover.

The improvement to SMLT shaves about 760 millisec off Nortel's past SMLT technology. (Past failover time of 830 millisec will be cut down to 70 millisec; optical SONET networks in carriers fail over in 50 millisec).

While this may seem like an imperceptible blink of an eye, the gap is huge for networks that run latency-sensitive traffic, Gupta says.

"This provides business-grade voice with no disruption at all, in case of a link or switch hardware failure," Gupta says.

Nortel plans to introduce SMLT on more of its LAN products in the second half of this year. In the third quarter, SMLT is expected to be available on the ERS 8300, a chassis-based wiring closet device, and Nortel's BayStack line of fixed-configuration boxes.

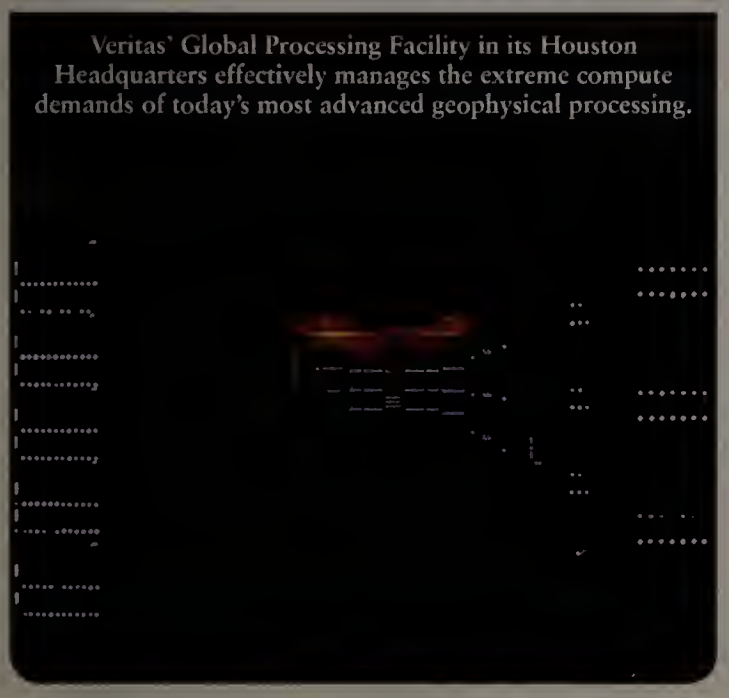
This product push comes after Nortel experienced several rounds of leadership changes and restructuring last year. Two key executives — CTO Gary Kunis and COO Gary Daichendt — left abruptly in June, followed by the departure of CEO Bill Owens, who had been on the job for a little more than a year. He was replaced by Motorola President and COO Mike Zafirovski. In a restructuring in September 2005, the head of Nortel's enterprise group, Malcolm Collins left. Steve Slattery, who once headed Nortel's carrier wireless group, took over.

In enterprise switching, Nortel has slipped from 6.3% of the total Ethernet market in 2003 to less than 5% in 2005. Cisco controls 69% of worldwide Ethernet revenue, according to Synergy Research Group. ■

Realizing a Dream Data Center Design

Using Force10 high-density switch/routers, Veritas' IT team was able to implement the simple, scalable design they desired.

Processing volumes of data better, faster and cheaper is at the heart of Veritas DGC's value proposition to its customers — making IT strategic to the company's competitiveness. So when it came time to upgrade its computing clusters from Fast Ethernet to Gigabit Ethernet (GbE) connections (one of several cluster interconnect technologies used), the IT team knew it had an opportunity to design a network core that could help the company reduce data center costs and hone its competitive edge for years to come.



Veritas' Global Processing Facility in its Houston Headquarters effectively manages the extreme compute demands of today's most advanced geophysical processing.

Veritas, headquartered in Houston, Texas, is a leading provider of integrated geophysical information and services to the petroleum industry worldwide. Among its services are seismic survey planning and design, seismic data acquisition, and the processing, visualization, and archiving of 3D and 2D data.

Due to the enormous amount of processing capacity and network bandwidth required to manipulate such complex data, Veritas' IT infrastructure is key to its ability to generate revenue. Making that infrastructure ever more efficient is a challenge for IT. "We have to be able to drive down our costs so we can reduce costs to customers," notes Phil Gaskell, Veritas' Global Network Manager. "If we can deploy a network for $3 million as opposed to $5 million, we can deliver a more cost effective solution and improve our bottom line."

When IT staff brainstormed about what the ideal data processing facility design would be, it became clear they wanted fewer layers in the network. "That was our dream design — everything taken away, with a big chuffing switch with lots of ports at the core," says Doug Northrup, Veritas' Houston Manager of Networks. Force10 Networks was the only vendor that could deliver a switch/router with the port density and resiliency Veritas needed, according to Northrup.

Realizing the Dream Core

The initial challenge facing the IT team was to scale the network core in each data processing center to accommodate large numbers of GbE interfaces. But the team also wanted a network design that was flexible and scalable enough to accommodate new technologies and traffic flows down the line. Lacking a very high density core device, other networking vendors proposed designs that required numerous inter-switch links. And IT would have had to build resiliency into the network through redundant devices, links and other mechanisms.

"That design would have cut down on the infrastructure's scalability and increased the cost and complexity," Northrup says. "You end up using more ports to connect switches together than you do for connecting systems to switches. And instead of a non-blocking core, you have to implement an oversubscribed core."

In contrast, Force10's E-Series 1200 switch/router scales up to 1260 GbE or 224 10 GbE ports per chassis and features a non-blocking switch fabric. The E1200 has allowed Veritas to eliminate an aggregation layer from its network architecture, reducing overall network cost as well as latency. "Don't aggregate unless you have to," Gaskell advises. "It adds costs and inefficiencies."

In addition to high port density, resiliency is built into the E1200. All E-Series devices have fully redundant components, ensuring hitless failover with no packet loss in the event a component fails. The E-Series also has a fully distributed architecture with independent processors for switching, routing, and management, which allows faults to be contained. Because resiliency is inherent in the E1200, Veritas' IT team didn't have to build these capabilities into the network, thus lowering their operations and management overhead.

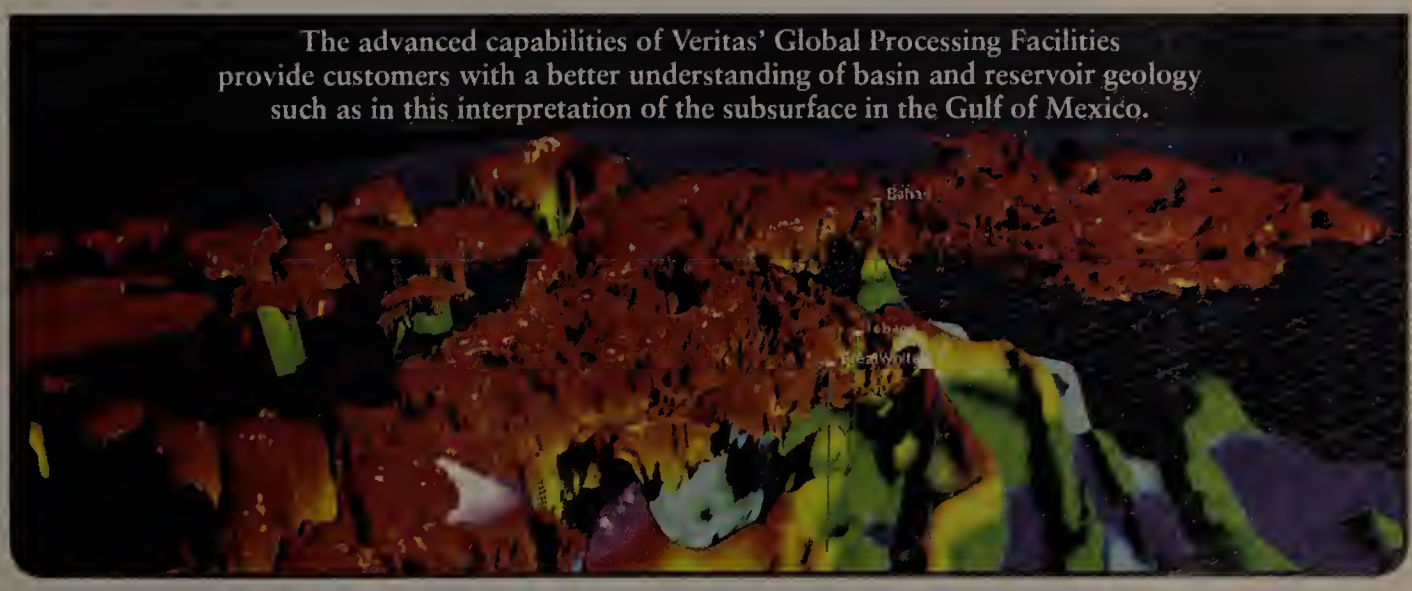
"The E1200 is a very well designed, redundant piece of machinery," Northrup says. Gaskell concurs: "The only component we could break was the paint. I can sleep well at night."

The Ultimate Benefit: Flexibility

Veritas currently has Force10 E600s and E1200s deployed in its Houston, London, and Singapore data centers. Having such high-density switch/routers has allowed IT to build efficient, high bandwidth, resilient data center back ends with the scalability to accommodate future changes.

And by allowing Veritas to implement a simpler network design, the E1200 has enabled IT to drive down equipment and overhead expenses. Fewer devices in the network means lower power consumption and cooling costs, for example, and less management overhead. Northrup notes that transitioning to Force10's equipment was "seamless," with virtually no learning curve for the staff.

Above all, Force10 has given Veritas flexibility. "We're always pushing the edge with new technologies," notes Gaskell. "Flexibility was one of the main things we were looking for. We don't know what's coming around the corner and we don't want to lock ourselves into an architecture. Such a high density core gives us the flexibility to explore different design options. And if a new technology comes along, or the algorithms or traffic flow change, we wouldn't have to re-engineer the network or forklift out the infrastructure with Force10."



The advanced capabilities of Veritas' Global Processing Facilities provide customers with a better understanding of basin and reservoir geology such as in this interpretation of the subsurface in the Gulf of Mexico.

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Chambers

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felt for over a decade that those markets would completely come together, with data, voice, video and mobility convergence. We felt that you just couldn't play in one. [We believed] the lines between them would dramatically blur, in part, based on how well service providers executed.

Service provider and SMB are about 25% [of revenue] each, enterprise about 45% and consumer about 4%. So consumer has the potential for the fastest growth. In terms of dollar contribution, the commercial marketplace is where we would anticipate the whole industry seeing the most growth, especially the networking [sector]. The commercial marketplace for us last quarter grew in the mid-20% range, while our business as a whole grew in the low teens.

We still have about 45% to 50% of our [engineering and R&D] resources focused on service provider. Enterprise continues to be the leading-edge user for much of the marketplace, especially as we make our moves into the data center and with the virtualization of application servers and of storage. We think the network will become the platform that will deliver services, applications [and more] to all four markets.

Should enterprise customers be concerned that you have too much on your plate right now?

When we go into a market our goal has always been to be No. 1 or 2 with, ideally, 40% market share. Our hit rate has been really high, unlike almost all of our peers. Very few of the players in the industry have gotten beyond one or two primary products. We're in the eight to 15 range. So we've had a remarkable track record.

Our natural alignment is toward our enterprise customers. Actually, enterprise points us to what we need to do in service provider, [SMB] and even within the consumer segment. When I [spoke recently] with a large customer, they said they want us to have a security strategy for the enterprise but they want us to have it across service providers and down to the home.

Secondly, many of our ideas have always come from the enterprise side. The Big Three [automakers] pushed us really hard on changing our support model to add the thin layer of consulting. They said 'If we're going to become dependent on you as our preferred player in so many areas, you've got to help us adjust to the new technologies faster. And you've got to tie them together and help us do that. While we might have expertise in some of the areas, we will never have expertise across the board. And while your partners will help us, nobody can help us like you do.'

Our track record has shown we've always stayed committed on issues. Part of the reason people standardize on us is when we say we're going to do something, even if it takes us a long time to get it right — network management we're still trying to get right — we stay with it, stay committed to what we're doing, or if we change we let them know.

GARY LAUFMAN

Cisco President and CEO John Chambers says the company's multiple products, upgrades and strategies offer customers flexibility rather than overload.

> "We made a decision ... that we felt the [network markets] would blur. None of our peers followed that."

The initiatives you're undertaking with application networking and security put you in contention with people who are currently partners. Are you concerned about this?

Philosophically, I don't partner and then compete later. I won't enter into strategic partnerships that I think will not have lasting evolution. Secondly, using IBM as an example, they are my best partner today and they will be my best partner 10 years from now. Third, we see the market evolving very similarly. We share what we're doing with them very closely, they share what they're doing with us very closely. And both of us have the same philosophy.

Isn't IBM's strategy a countervailing notion to providing virtualization through the network — they are providing virtualization through the management layer — and doesn't that by its very nature put you in competition?

There will be segments in which we may have overlapping philosophies. But if you take a step back, it's real simple. I will partner with IBM for as long as I think it is strategically very important to my company and I deliver on my ethical commitments. If there's a little bit of overlap in one area, and yet we can dramatically grow the revenues, profits and customer loyalty because of our ability to work together, then [IBM and Cisco] are going to do that. And then we'll let the [market] sort out which products take the lead. We're not going to let our fields mess up each other over a product which accounts for a small percentage of our revenue vs. growing it in other areas.

If you look at IBM's total revenue in the data center, consulting or outsourcing or in so many other areas, our overlap is a relatively small number. Our ability to grow those others dramatically faster by working together is [more important] than saying that if we have any overlap we're not going to work together. If you overlap too much and your visions of how the market evolves are too different, you can't have a partnership. But I don't think that will be the case.

If you go back to innovation being doing it yourself, acquiring or partnering, remember that 90% of the acquisitions in my opinion still fail. But our hit rate has been remarkably high. If you can't acquire, I would argue you can't partner. Partnering is much more difficult than acquiring: At least [in an acquisition] you control the resources for a period of time. I believe that partnering will be one of the four or five major variables that determine a company's success. And partnering is not reselling products. It's really about whether you can go to market together with the strengths of both organizations in a way that gets you competitive advantages and really focuses on delivering the power of the network to your customers.

You have initiatives under way in the data center, storage, security, application networking, among others. Is there a fear of overloading your customer base, asking them to make too many upgrades, buy too many products, buy into too many strategies, at a time when they are trying to reduce complexity?

CIOs are very concerned about the complexity that exists and the costs of supporting that complexity. But I would argue the reverse: that actually works to our favor as opposed to our detriment. If we can touch so many of those elements off of a common IP open standard that they don't have to worry about changing all their applications, it gives them a lot of flexibility. So when you talk to the CIOs you're finding more and more of them are leaning stronger and stronger to

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IETF

continued from page 1

The IETF is an egalitarian, all-volunteer group consisting of network engineers from Cisco, IBM, Microsoft, AT&T and other leading vendors. It has created many of the underlying standards that make the Internet work, including fundamental routing, e-mail, directory services and telephony protocols.

IETF leaders say the group's greatest accomplishment is that the protocols it developed let the Internet function in spite of dramatic growth and the introduction of new services.

"Despite all kinds of centrifugal forces, the Internet's technology has stayed reasonably unified and coherent during the tremendous growth of the last 20 years, the enormous changes in underlying transmission technology and the era of telecommunications liberalization," says Brian Carpenter, chair of the IETF and a distinguished engineer with IBM.

"The [IETF's] real achievement has been keeping focus on the unifying ideas, such as the end-to-end principle," Carpenter adds. "The IETF didn't invent those unifying ideas, but it's used them in its protocol development work, blended with pragmatism."

Despite the group's many engineering triumphs, the IETF is best known for its openness and individualistic approach to standards development. It also differs from other staid standards bodies because of its quirky traditions, which include registering approval by humming rather than raising hands.

"The biggest strength of the IETF is its openness," says Harald Alvestrand, a Cisco fellow who led the group from 2001 to 2005. "We are able to take input from the whole world, and we arrive at our decisions through a process that you are welcome to watch and participate in."

Alvestrand says the IETF's openness coupled with the expertise of its participants result in higher-quality standards.

The IETF held its first meeting Jan. 16-17, 1986 in San Diego with 21 attendees. In March, the group will hold its 65th meeting in Dallas, and more than 1,000 attendees are expected. It will publicly recognize its 20th birthday at the meeting.

The IETF meets three times per year, but most of the group's decision making is done via e-mail posted on its Web site, www.ietf.org.

The group has created many important network industry standards, including Border Gateway Protocol and Open Shortest Path First for routing; Post Office Protocol and Internet Message Access Protocol for e-mail; Session Initiation Protocol for Internet telephony; and Lightweight Directory Access Protocol for directory services.

Other well-known IETF technologies include MPLS for traffic engineering, the IPSec security protocol used in VPNs and the next-generation Internet protocol known as IPv6.

"What we do is architect the Internet, and the Internet is still a pretty rollicking place," says Fred Baker, a Cisco fellow who served as chair of the IETF from 1996 to 2001. "We describe different functions that get done and principles by which they work, which is a different way to do architecture."

The group has published more than 3,300 protocol documents known as requests for comments. These documents, which are used daily by corporate network managers, outline standards for configuring hosts, authenticating users, monitoring networks and many other necessary tasks.

"The IETF is interested in building something like a Swiss Army knife," Baker says. "We give you the tools and you can go build your network. If you don't have the right tools, then you can come back and identify the tools you need and we'll build them."

The IETF has created duds, too. IETF protocols that were never widely deployed include IP Multicast, a bandwidth-conserving technique for broadcasting information; and DNS Security, a technique for securing the DNS using public-key encryption.

In some areas, such as firewalls and instant messaging, the group failed to produce standards fast enough for the marketplace to adopt. However, its greatest misstep was its failure to grasp the importance of built-in security.

"We didn't get serious about security early enough," says Scott Bradner, a senior technical consultant with Harvard University who held leadership positions with the IETF from 1993 to 2003. "The Internet carefully delivers that virus to your door because its job is to deliver packets and not to inquire whether the application is good for you. The 'Net by itself is doing what it should do, but we don't have intrinsic integrity and authentication. We didn't do that way back when, and it should have been done."

Unlike other standards-setting bodies such as the IEEE, World Wide Web Consortium and the International Telecommunication Union (ITU), the IETF has individual rather than corporate or government participants. Anyone can propose a protocol to the IETF, but the protocol must achieve rough consensus from the group and have working prototypes before it can be approved as a standard.

"In the ITU, governments approve the standards, and formal submissions come from companies," explains Bradner, who serves as liaison between the IETF and ITU. "In the IETF, it's individuals, not companies, who submit ideas. And it's the consensus of the community as interpreted by the IETF leadership that prevails. That's very different from having Germany decide it doesn't like a standard."

Bradner says the result of the IETF's non-governmental approach is that the group doesn't focus on protecting existing industries or companies. The ITU and other standards bodies "tend to create standards that will not necessarily disrupt incumbent companies like carriers, but the IETF doesn't have that formal sensitivity," Bradner adds.

Another key difference is that the IETF makes decisions based on rough consensus rather than unanimity. The IETF leadership will approve a protocol document even if 10% of the group's participants disagree, while other standards bodies make changes or additions to a document so all participants support it.

The rough consensus approach makes the IETF's process more contentious, while the group's openness makes its process take longer. One of the main criticisms of the IETF is that it takes too long to publish proposed standards. For example, the IETF has been working on aspects of IPv6 since 1994.

The IETF faces many challenges, including declining attendance at its meetings and increased competition from other standards bodies.

In 2000, at the peak of the Internet bubble, IETF meetings attracted more than 2,800 attendees. At its meeting in November, the group had 1,200 attendees.

The IETF can't afford to lose money on its meetings because it doesn't charge membership fees. However, many longtime attendees say the current meeting size is better for getting work done.

"When we had 3,000-person meetings, a lot of the people were not there to work on things," says Baker, who attended his first IETF meeting in 1989. "The meetings that we have are smaller. The mailing lists are more contained, and the work is actually proceeding better."

The IETF recently reorganized its administrative functions to gain greater control over its finances and meeting-related expenses. Alvestrand, who encouraged the group to reorganize during his stint as chair, says it's too early to tell if the new administrative structure will work better than the less-formal systems of the past.

"By the end of 2006, we'll be able to tell," Alvestrand says. "When we've had service contracts in place for a year and have had monies for the meetings flowing through hands that are accountable to the IETF, we'll know."

Meanwhile, rival standards bodies such as the ITU are looking to encroach on areas of standards development that traditionally were handled by the IETF, while new standards bodies such as the Liberty Alliance Project and the MPLS Forum are cropping up to address standardization for emerging Internet services.

The IETF's biggest challenge is "continued relevance," Bradner says. "Finding new things to do or old things to work on which are relevant to the needs of the networking world going forward is key."

Nonetheless, IETF leaders are optimistic about the group's future, especially the technical challenges that lie ahead.

"I expect to see a lot more work on quality of service and of course on security," Carpenter says. "And we need some breakthrough thinking in the area of resource discovery. Using the DNS to find things is a really bad compromise, especially as we move toward fully internationalized naming of resources."■

IETF highlights

The Internet Engineering Task Force turns 20 on Jan. 16. Here are highlights from the standards-setting body's illustrious and irreverent past:

Greatest accomplishments: Producing key protocols that allow the Internet to work, including Border Gateway Protocol, Open Shortest Path First, Session Initiation Protocol, Post Office Protocol, Internet Message Access Protocol, Lightweight Directory Access Protocol, MPLS and Simple Network Management Protocol.

Lost opportunities: Has failed to produce standards fast enough for the marketplace in some areas such as firewalls, instant messaging and spam.

Funniest moment: Internet pioneer Vint Cerf, who always wears a three-piece suit, stripped down to a T-shirt that read "IP on Everything" at the IETF's July 1992 meeting in Cambridge, Mass.

Saddest moments: The deaths of Jon Postel, editor of the IETF's standards documents known as requests for comments, in 1998, and Routing Area Director Abha Ahuja in 2001.

Quirkiest traditions: Humming approval. Publishing phony protocol documents on April 1. Hosting late night Pretty Good Privacy signing parties. Toasting universal deployment of IPv6 with scotch.

Loudest argument: The swearing, table-jumping brawl over the inclusion of encryption in IPv6 at the April 1995 meeting in Danvers, Mass. Other infamous IETF fights include a revolt over the leadership's selection of the next-generation Internet Protocol at a 1992 meeting in Cambridge, Mass., and a raucous debate about wiretapping at a 1999 meeting in Washington, D.C.

Fastest protocol development effort: Blocks Extensible Exchange Protocol (BEEP), which supports connection-oriented, asynchronous interactions. The BEEP working group was formed and concluded its work in 2001.

Longest protocol development effort: IPv6. The IPv6 working group was formed in 1994 and has not disbanded. IPv6, an upgrade to the Internet's main protocol, is not widely deployed.

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The Power of Being

Aruba, Meru air WLAN wares

BY JOHN COX

Aruba Wireless Networks this week plans to announce wireless LAN products that address the needs of small companies and branch offices. Separately, Meru Networks says its latest offering zeroes in on wireless security.

The new Aruba 200 Mobility Controller packages the company's high-end WLAN features into its smallest and lowest-priced product. The 200 model can have six access points attached and supports about 100 simultaneous users. The company's previous low-end controller, the Aruba 800, can connect 16 access points and 250 users.

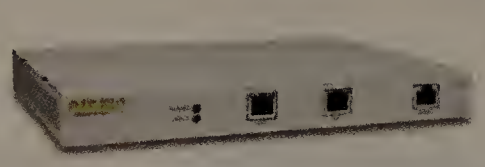
A key change is ease of installation, Aruba says. Office workers plug in the power cord and attach some cables, and the 200 model automatically creates a secure IPSec VPN link to an Aruba master controller at a central office. The 200 model then downloads user information, security profiles and settings, and configuration settings for itself and attached access points.

Competing in this market are Cisco's Integrated Services Router fitted with a recently announced WLAN blade, Symbol's WS2000, and similar products from Trapeze Networks and others.

The 200 model starts at $1,750 (the 800 model started at $5,000).

Also new from Aruba is the Mobility Management System, which shifts from the company's controllers to a server or an appliance an array of tasks, including WLAN planning, radio frequency management and network monitoring.

Farpoint consultant Craig Mathias likes the idea of a management appliance. "It's all in one place, you turn it on, and then you don't have to do a lot of work setting it up and managing it," he says.



The new Aruba 200 Mobility Controller is designed for simple installation by office staff in branch offices or retail-chain sites.

The Mobility Management System is available in a rack-mounted appliance and as software that can be loaded on existing servers.

The appliance version starts at $22,000 and supports as many as 250 Aruba access points. The software-only version starts at $4,000 for 50 access points.

Meru's move

Meru is expected to release an optional application called the Security Services Module for its wireless controllers. The code can manipulate the radio signal from Meru access points, adding a layer of security to a corporate wireless network, according to the company.

The software adds three capabilities. First, it enables an access point not only to process traffic destined for it but also to act as an RF scanner in the time between frames. Other vendors make use of separated, dedicated radio scanners, or force an access point to switch sequentially between processing and scanning, says Meru CTO Vaduvar Bhargavan. Switching takes times, and adds latency that can degrade or disrupt voice and video traffic, he says.

Second, the software lets a controller order an access point to jam a detected rogue device by transmitting a signal designed to collide with the rogue's signal while the access point maintains links with authorized clients. The rogue, in effect, disappears; wireless clients can't see it and therefore ignore it. Rival products have the access point send out de-authenticate packets to a rogue, a technique that consumes bandwidth, according to Bhargavan.

Third, Meru's software can create a transmission that only designated sender and receiver radios can sense. Other nearby radios sense only RF noise.

The product, scheduled to be available by June, will start at $2,500 for 50 access points.■

Linux vendors stepping up their focus on security

BY JENNIFER MEARS

Customers should expect to see enhanced, easier-to-use security tools from leading Linux distributors in the coming months as vendors focus on making the platform tough enough to support even the most critical business applications.

Gone are the days of having to bolt on Linux security features through patches to the kernel. The Linux 2.6 kernel includes the hooks necessary to integrate security directly into Linux distributions without modifying the kernel itself.

That means users should see offerings that fit right into their Linux environments, analysts and industry experts say. It's a reflection of the maturing of the Linux operating system and a growing focus on security by vendors such as Novell and Red Hat.

While Novell is working at integrating its longstanding security tools, such as identity management, into its SuSE Linux distribution, users can expect to see Red Hat build out offerings on top of technology it acquired from Netscape, including a directory server and a certificate management system.

"The key focus moving forward is to make sure we build security into every component, every process, every bit of what we're doing," says Mike Ferris, director of security solutions at Red Hat. "When we think about security, it's really about making it ubiquitous."

As an example, Novell and Red Hat now build application security into their Linux offerings. Application security technology limits access to operating systems and protects applications and operating systems from internal and external threats such as malicious code and viruses. The idea is to protect data on Linux from application vulnerabilities without having to resort to emergency patching.

Red Hat includes Security Enhanced Linux (SELinux) in Red Hat Enterprise Linux 4. SELinux is a National Security Agency-backed project that enables users to set detailed access controls to protect operating systems from threats.

Novell offers AppArmor, access control software it acquired from Immunix last May. Novell has offered AppArmor as a standalone product since the fall, but last week the company announced it was integrating AppArmor into its SuSE Linux distribution. The company also kicked off an open source project built on key components of the AppArmor code.

Developers can go to www.opensuse.org/apparmor and have full access to the source code, says Charlie Ungashick, director of product marketing for Linux at Novell. "That way, we will garner community involvement to review, test and develop the technology."

Analysts say the move is a good one for Novell, whose biggest challenge is to raise awareness of the AppArmor technology. Novell executives say AppArmor is a simpler approach to application security than SELinux. Some analysts agree, noting that today most SELinux deployments are in the government sector.

"Novell AppArmor is less complicated to implement than SELinux," says Stacey Quandt, research director of security solutions and services at the Aberdeen Group. "The challenge for Novell is not technology but marketing. By creating an open source project around AppArmor, it may be of more interest to developers and increase the mind share and use of the technology."

For users, the biggest issue is whether specific applications are supported by the application-security approach, Quandt says. That's why Red Hat and Novell are working with independent software vendors to ensure that applications can take advantage of the security features.

"For some users, the ease of implementing Novell AppArmor will be preferred," Quandt says. "Red Hat needs to make SELinux easier to implement and use."

Red Hat's Ferris counters that SELinux is perceived to be more complex than it really is. "Since we released Enterprise Linux 4, Security Enhanced Linux has been turned on by default in every install of Enterprise Linux," he says. "That means there is a set of applications that is taking advantage by default of the mandatory access-control system. So users aren't even aware in some cases."■

Steeling Linux

With Linux a given in most data centers, vendor focus now is on hardening the platform. A look at what Red Hat and Novell offer and have planned for Linux security:

Red Hat:

SELinux: Integrated into Red Hat Enterprise Linux 4 to provide secure access controls.

ExecShield: Prevents malicious code from running when a buffer overflows.

Red Hat Directory Server: Maintains user profiles, access policies and other data for identity management.

Red Hat Certificate System: Generates and manages digital credentials; Red Hat is working on integrating smart cards into the system.

Novell:

AppArmor: Alternative to SELinux, secure access-control technology that Novell acquired from Immunix; code contributed to the open source community last week.

Novell eDirectory: Includes smart cards and tokens to manage user profiles and access policies.

Security assessments: Short- and long-term consultations to evaluate Linux security needs.

OPERATIONAL BI: BUILDING THE FUTURE

WITH BUSINESS NEED DRIVING INFORMATION ANALYSIS DEEPER INTO THE CORPORATION, CIOS MUST MAKE OPERATIONAL BI A REALITY TO TRULY IMPACT OPERATIONAL EFFICIENCY.

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POWERING DATA ANALYTICS

AS BUSINESSES INCREASINGLY stake their survival on the ability to manipulate and analyze data, the importance of operational business intelligence has skyrocketed. Operational BI, which embeds analytical processes within the operational business structure to trigger real-time decision making and collaboration, is fundamentally changing how data is used, where it exists and how it is accessed.

This change is rapidly exposing the limitations of traditional analytical tools. Most traditional databases and data warehouses don't take into consideration the increasing use of unstructured data stored outside these systems. Moreover, data used for operational analysis is frequently accessed before coming to the data warehouse, such as RFID data coming from a store or warehouse being used at a number of points before being sent to a data warehouse. That trend will continue with the soaring growth of self-service technologies, a trend that demands split-second return times on queries that are increasingly integrated into the business process.

As operational BI spreads, CIOs and IT managers face a dilemma: They must enable new strategies for how their companies use information, or risk a significant competitive disadvantage. But how do you ensure success as you move from operational BI theory to reality? The following tactics are key to the successful implementation of this promising new technology.

Choose service-oriented tools and products. Operational BI depends on a company's ability to collect and analyze information midstream—such as a point-of-sale cashier accessing a

customer profile to offer tailored promotions—before sending it to core systems, regardless of who owns the master data store. "The ability to get a glimpse of the entire pipeline in and outside of the company is very valuable to the agility of a corporation," says Chris Thomas of Intel Corporation. A new generation of service-oriented BI tools that can collect feeds mid-tier and then send the results of this analysis along to core systems helps companies respond quickly and effectively to changing market conditions. Products such as Sybase IQ and Avaki, for example, are built to respond to operational BI requirements.

Build a foundation of service-oriented architecture. Service-oriented architecture that lets users access real-time knowledge with a set of service feeds can maximize business agility while reducing complexity. For example, SOA flexibly and cost-effectively supports the midstream, on-the-fly data collection and analysis necessary for operational BI. Service orientation also supports operational BI throughout the business by pushing BI data out to the mobile workforce and enabling workers across the enterprise to incorporate this vital data into their workflow. The hardware foundation for SOA should include robust, open standards-based 64-bit platforms such as HP servers powered by the Intel® Itanium® 2 processor.

Consider Enterprise Information Integration. EII, as evidenced in solutions such as Avaki, federates data sources to provide a single view for end users and is a good choice for customers with information coming from dozens of sources and users who need to make decisions on the fly. For example, the new straight-through processing requirements in the financial services industry will drive institutions to perform immediate risk analysis and increase the need for operational BI.

VALUE ACROSS THE ENTERPRISE

Operational BI proves a smart investment from both the business and technology perspectives. By taking the guesswork out of operational decision making, companies can tie decisions directly to pertinent business information and make decisions on the fly throughout the enterprise. Imagine sales reps sending and receiving real-time order and refill data via mobile devices, and warehouse workers using that data to reroute deliveries en route. Or consider the value to financial workers using real-time data to do immediate risk analysis. Those decisions can be based on information pulled from a wide variety of data, and that data will be available regardless of location, as mobile workers use operational BI information from a variety of devices. Operational BI solutions from Sybase running on HP servers with the Itanium 2 processor should scale to the ever-increasing user population that needs to access analytical data at the production level.

FOR MORE ON operational BI and the data explosion, go to: www.networkworld.com/go/dataexplosion.

On the technology front, "CIOs should expect faster query speeds and faster data loading as their operational BI solutions take advantage of performance boosters such as a 64-bit architecture and analytics algorithms that have been optimized for the Itanium 2 processor," says Thomas. They should find infrastructure management easier and more cost-effective as a partitioned, virtualized environment allows for flexibility in meeting peak demands, along with better management of hardware and server growth. With a solution based on Sybase IQ, HP servers and the Itanium 2 processor, storage and hardware investments should lessen long term—Sybase IQ requires less storage and hardware than traditional database environments, and powerful Intel Itanium 2-based servers from HP can support rising workloads and offer capabilities to support virtualization and enhance manageability.

In the final analysis, taking the time to understand the opportunities and challenges from both business and technology perspectives should pay big dividends in business value down the road. "Define pain points in business value terms," says Joseph Shaffner at Sybase. "By applying analytic solutions at the operational point of pain itself, companies can derive immediate business advantages. This is the promise of operational business intelligence."

ACTION ITEMS

Tactical Tips

Network managers need to plan for the impact of deploying operational BI within the framework of a service-oriented architecture. Among the important issues:

Throughput management. Network configurations should be optimized to work well with a virtualized environment. This typically requires monitoring traffic patterns to plan for times of peak workload and ensuring that data flows freely to users regardless of location.

Optimizing performance. Network managers need to analyze and rework the network to ensure that it is tailored to the performance needs of operational BI. This includes planning for traffic to the middleware layer as it extracts data from disparate sources.

Remote access for field staff. Mobilizing operational data for field staff requires network managers to plan for configuring data so it is downloadable to a multitude of mobile devices. They must also provide network security as mobile users log onto the network, and explore wireless coverage issues.

Mobile information access and cross-enterprise collaboration. As more mobile users download enterprise data from operational BI sources, network managers must analyze and provision for the additional traffic flowing across the network. This also applies to increased collaboration among companies, as businesses increasingly open their firewalls to allow collaboration among suppliers, distributors and other business partners.

NET INFRASTRUCTURE

Short Takes

■ **Fidelis Security Systems** last week announced an upgrade to its data-leakage prevention software that includes additional policy templates and new management features. **DataSafe** is designed to block the unauthorized transfer of sensitive or regulated data across network channels, including e-mail, HTTP, FTP, instant messaging and peer-to-peer communications. Instead of tracking who is granted access to certain data in an organization, DataSafe secures the information by analyzing content via statistics, pattern recognition and exact matching, and then prevents sensitive data from leaving the organization. In Version 3.8, the company has included templates that search for data related to the Department of Defense's data classification system and the Payment Card Industry Data Security Standard. The latter is a means of enforcing data security standards in businesses that process credit card information. Users can configure the templates to send out an alert when sensitive information is about to be sent out of the organization, or prevent the data from leaving, Etue says. DataSafe is priced at $65,000 per sensor for the 32-bit sensor and $95,000 for the 64-bit sensor. The management console is included free.

■ **Funambol,** a developer of open source data-synchronization software for mobile devices, has licensed its Sync4j mobile application server to CA, the company said last week. The software works with mobile devices supporting the SyncML standard to synchronize contacts databases and other information between devices. Funambol intends this year to expand Sync4j's capabilities to include push e-mail delivery. CA will use the software in its tools to manage mobile devices such as smart phones, according to Funambol. The company created a new research division, CA Labs, to study mobile applications, advanced applications on converged networks and service-oriented architecture.

Branch nets get integrated help

BY TIM GREENE

Looking to eliminate the hodgepodge of devices users have to manage in branch offices, many customers are turning to single, multi-function devices known as a "branch in a box" that perform branch-office network functions while being managed remotely.

Branch-in-a-box devices support a core range of tasks (see graphic) and can take the place of four or five devices in offices that may have no permanent IT staff, says Dan Golding, an analyst with the Burton Group who says he coined the name as a product category.

One box can perform in place of a WAN router, Ethernet switch, IP PBX, firewall and other devices, he says. It also can host security applications.

Branch-in-a-box products are not to be confused with office-in-a-box gear, which includes print servers, storage, e-mail servers and other devices intended to support one-office businesses but not meant to be managed centrally as part of a large corporate network with hundreds of branches, Golding says. Vendors in this category are Critical Software, EmergeCore Networks, Right Vision (acquired by Alcatel) and Linksys One.

A range of vendors make branch-in-a-box products, including 3Com, Adtran, Kentrox and NetDevices, a start-up focusing on this type of gear that is unique because it developed its platform specifically to deal with multiple branch-office functions rather than evolving from an existing device, he says. Cisco's branch-in-a-box ISR routers lead the way, Golding says, with more than 500 million units sold since they were introduced 15 months ago. It was Cisco's most successful product launch ever.

Nortel is the most recent industry giant jumping into this area with its $99.5 million purchase last month of Tasman Networks, whose Converged Services Routers support routing, security, QoS and VoIP.

There is also speculation that Juniper is looking into creating its own branch-in-a-

See Branch, page 20

What's in a branch-in-a-box?

Multi-function devices that qualify as a branch-in-a-box must meet the requirements of a large business, not simply function as office infrastructure for a one-site small business, says Burton Group analyst Dan Golding, who coined the term. Key elements are:

- Switching.
- Routing.
- Remote management.
- Firewall.
- IP PBX.
- Wireless access point.

Yahoo, Sheraton offer Wi-Fi lounge

BY STEPHEN LAWSON, IDG NEWS SERVICE

Yahoo is getting into the Wi-Fi hot spot business with Sheraton Hotels & Resorts, but the partners aren't stopping there.

In a trial announced last week, the companies are setting up their own virtual and physical spaces — localized Web portals as well as lounges — in a few U.S. Sheraton hotels.

Free or fee-based Wi-Fi is nothing new in major hotels, including Sheraton facilities, but Yahoo and Sheraton are looking to enrich the experience with a "virtual concierge" Web portal for guests, and in some cases a special lounge in the lobby. The product, called Yahoo Link @ Sheraton, began in a trial last week with lounges and Web portals at the Sheraton San Diego Hotel & Marina and Sheraton Boston. The companies also launched portals for the Sheraton New York Hotel & Towers and the Sheraton Stamford in Connecticut.

At the core of the offering is a co-branded, localized Web portal for each hotel, accessible in lounge areas and guest rooms. When guests check in, they will be given pass codes to get on the Wi-Fi network and enter the portal, as well as to take advantage of other services in the Yahoo Link lounge, says Murray Gaylord, vice president of brand marketing at Yahoo. The portal will provide local information such as weather, nearby attractions and restaurants, and driving directions. Guests and hotel employees will be able to expand on those listings with their own reviews and recommendations.

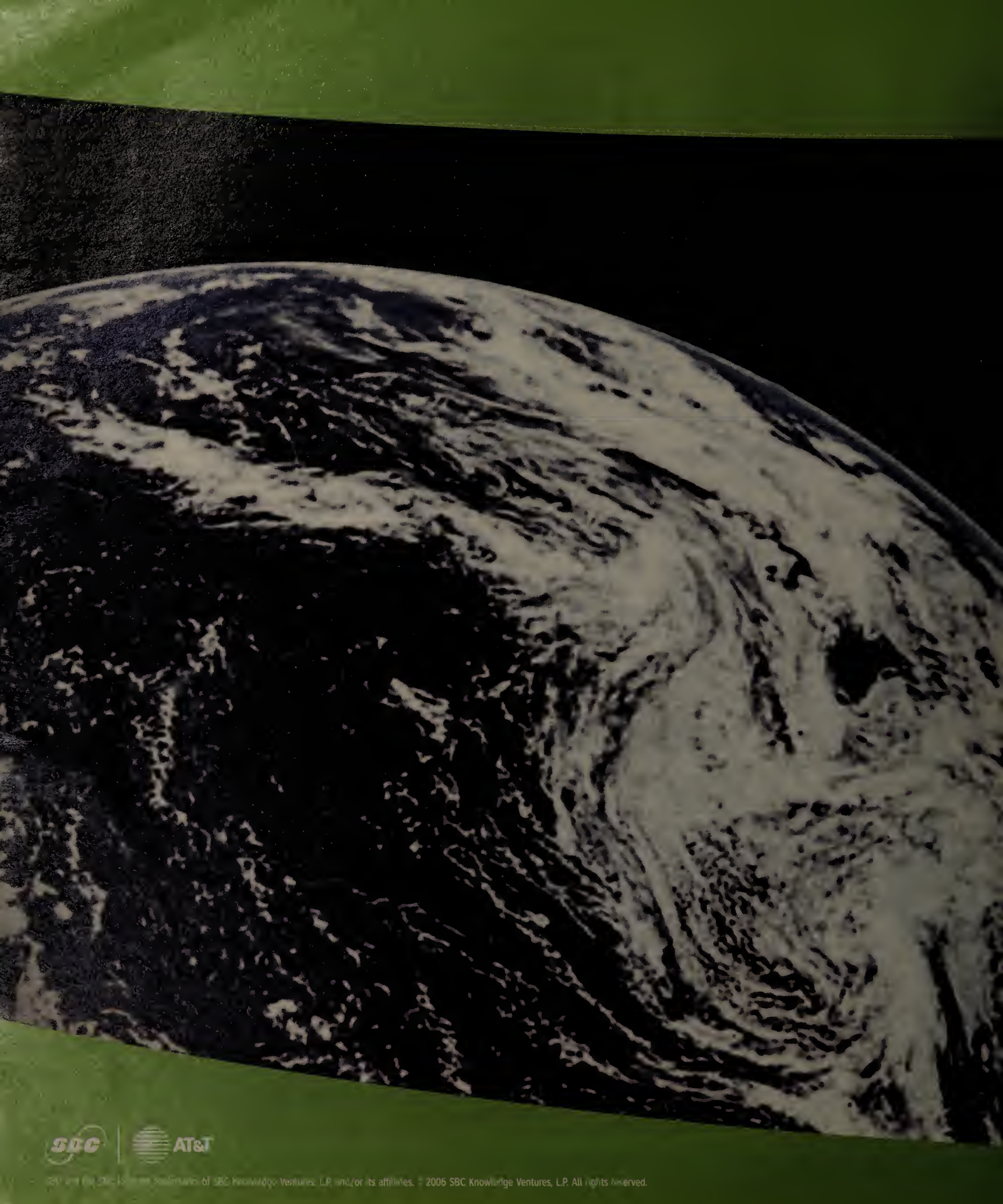
Hotel guests also will get a free 30-day trial of a bundle of Yahoo premium services, including Yahoo Music, Mail Plus, Briefcase, All Star Games and Finance Tracker.

The Yahoo Link @ Sheraton lounge areas will have a handful of Ethernet-connected desktop PCs and seating areas where guests can use their own devices. Guests at any time will be able to use the workstations and Wi-Fi and send documents to a printer in the lounge for free printing, Gaylord says. With printer access, traveling guests could, for example, print out airline boarding passes while waiting for their bags to be brought down. The area will feature comfortable seating, a plasma TV and refreshments for sale, he says.

Yahoo's customers told the company they wanted more than just a network connection or an online Yahoo presence when traveling, Gaylord says.

"People don't want to just stay in their rooms on the computer.... They want some kind of social interaction," he says.

Sheraton, a division of Starwood Hotels & Resorts Worldwide, with about 400 hotels worldwide, is responsible for the network infrastructure, while Yahoo takes care of the Web portal, Gaylord says. The companies will look at response to the trial in about six months to gauge whether to expand the offering in the United States or overseas, he says.■



NetPro offers protection for Active Directory

BY JOHN FONTANA

NetPro this week plans to upgrade its directory management tools to help customers better protect their environments from unplanned or malicious changes.

The company is set to ship Directory Lockdown 4.0 with new controls to protect a directory's configuration and schema settings from being altered on Windows domain controllers where Microsoft's Active Directory runs. The software also features a notification system that signals all attempted changes to IT executives, a customizable list of permitted changes and a new console interface.

As Active Directory has found its legs in corporate networks, administrators are discovering certain deficiencies with the software, such as a feature that lets administrators escalate their rights and perform potentially damaging changes.

"Because of compliance regulations a lot of the security auditors are paying attention to Active Directory," says John Enck, an analyst with Gartner. "And it is really coming up with deficits in auditing, change management, compliance, the ability to lock it down, ability to delegate. The limitations have always been there, but all of a sudden there is a lot more attention on them."

Microsoft plans to begin closing those gaps with the release of Longhorn Server by including the ability to read only domain controllers. But the software is not due until 2007 if Microsoft stays on track with the server.

With previous versions of Lockdown, NetPro prevented changes from replicating, but the 4.0 version takes a more proactive approach by blocking the changes from occurring, says Richard Hoey, product manager for Lockdown.

"Now we are analyzing the changes before they even hit," Hoey says.

Lockdown, which competes with similar change management software from NetIQ and Quest, is preconfigured to prevent any change to Active Directory's configuration or schema naming context (SNC). Those two areas of the directory contain all the configuration data for the Active Directory infrastructure, such as definition of a site. Typically that information does not change frequently. The domain SNC contains the user data, and NetPro plans to protect that SNC with technology slated for inclusion in its SecurityManager product later this year.

Once Lockdown is installed, users can craft their own customized list of allowed changes. Any other changes are blocked. The software also includes a notification system that alerts IT executives and records the who, what, when and where of the attempted change.

Lockdown runs using a series of agents installed on domain controllers. A client, which can be run as a thin-client terminal server interface or installed on a desktop, collects the monitoring information from each client. The agents feature NetPro's anti-tamper technology to protect their integrity. The client interface has been expanded to include such features as hot alerts that users can click on and get more detailed information.

Lockdown is available now and is priced at $6 per user.■

Start-up offers tool for security analysis

BY ELLEN MESSMER

Start-up Remnant Labs has announced a system-log analysis tool that aggregates log data from firewalls, intrusion-detection systems and other sources to alert managers about network security lapses.

The Universal Log Profiler runs on a PC or workstation and is intended as an alarm system to notify managers of violations in security policy, the company says.

"Log files contain valuable information about the configuration of networks," says Eric Lin, CTO and co-founder of Remnant Labs.

He says the purpose of the Universal Log Profiler is to immediately notify network managers of security violations, such as unauthorized open ports, IP addresses from banned sites or use of a machine in off hours.

Before starting Remnant Labs, Lin was the technical sales and development manager at Niksun, which makes the NetDetector analysis tool. He says the Universal Log Profiler can receive log-analysis data from firewalls, IDSes and other gear through manual or automated transfer on a scheduled basis.

The Universal Log Profiler can accept and analyze log data from firewalls made by Cisco, Netscreen, Check Point, Secure Computing and Nortel, as well as wireless routers from Linksys, Netgear and D-Link.

IDSes supported by Remnant Labs' product include open source Snort as well as commercial products from Cisco, Internet Security Systems, the Niksun NetDetector and the Nortel IDS.

Servers supported include Windows 2000 and XP, Linux, Solaris, FreeBSD, NetBSD, OpenBSD and the HP Unix system logs.

Intrusion prevention on the way

The Universal Log Profiler doesn't support any type of intrusion-prevention system but that is planned for future versions of the product, says Les Hribar, Remnant Labs CEO and co-founder, who worked at Niksun as senior vice president of sales.

Remnant Labs says it has about a dozen customers, including shipping and warehouse firm Rapid Freightways, in Santa Fe Springs, Calif. Hribar and Lin say their log-analysis product ships with policy templates to analyze about 40 types of security violations, and new ones can be added to reflect corporate requirements.

The Universal Log Profiler costs $8,500 with support for 10 devices.■

Profile: Remnant Labs

Location:	San Francisco
Employees:	20
Founded:	2002 by CEO Les Hribar and CTO Eric Lin. Both come from security vendor Niksun.
Funding:	$1 million in angel investor funding.
Product:	Universal Log Profiler, which aggregates and analyzes log data for security purposes.

Branch
continued from page 17

box device. "Juniper has not announced anything, but there are rumors flying around, including sightings of experimental boxes that have a combination of the Juniper J-series router and the NetScreen firewall in one box," Golding says.

Juniper says it doesn't comment on future product development.

Cisco's ISR gear stands out not only for its popularity but also for its premium price. ISRs cost 30% to 40% more than most of the competitors' gear, Golding says. For instance, a Cisco 3825 costs $10,500 to $16,600, while a Tasman (Nortel) 3120 costs $6,400 to $12,900. But for the lower price, customers also get fewer feature options. The Tasman box has no IP PBX support, while the Cisco 3825 supports Cisco's IP Call Manager Express for local call processing.

A strength of these devices is that they are modular, letting customers add features as they need them. For example, the U.K. financial firm Close Motor Finance uses NetDevices SG equipment as a branch-office router at its disaster recovery site in Peterborough, England. But because the gear also supports security features, Close Motor may roll it out in some of the 22 branch offices its IT department supports. This would be in place of separate Cisco routers and Fortinet security devices.

"It was never economically feasible to have a member of my IT team based in the branches," says Dave Coleman, head of IT for Close Motor, who has eight IT staffers. "So it is important that we have as few maintenance and configuration issues as possible." Having fewer devices in each branch translates into fewer maintenance and configuration problems, he says.

Adequate branch staffing is becoming a more common problem as businesses consolidate their servers, bringing them in from branch offices to central data farms, Golding says. As servers move out of branches, so do IT workers who handle the rest of the local network.

Close Motor also is considering a switch to VoIP in its branch offices very soon, says Rob Tomlinson, technical director for Global 20, the technical support company Close Motor uses to outsource some maintenance of its network. He says he likes the modular design of the NetDevices operating software that supports upgrades of the VoIP software without affecting the operation of other functions on the device. "You can restart individual modules without having to reboot and lose the whole machine," he says.

The future of these devices lies in how many features they come to support over time. If Juniper gets into the field it could bring about immediate changes by adding what is recognized as a world-class firewall (NetScreen) and possibly adding WAN optimization, technology the company acquired when it bought Peribit; last year, Golding says.

The one factor nobody can be sure of is how long this gear can remain trouble-free — an important characteristic for customers. "One thing about branch-in-a-box devices is they're designed to sit out in a branch for three, four, five years, preferably without somebody touching them," Golding says. "You'll have to put them out there for a few years and find out."■

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ENTERPRISE COMPUTING

EMC girds for grid computing

BY DENI CONNOR

Quietly, EMC has been integrating grid into its technology strategy and product portfolio for months, but the company started to make some noise about it earlier this month with a $30 million buyout of middleware technology from Acxiom.

Acxiom will continue to use the technology to power its managed information service, which it will develop further and market with EMC. But Acxiom, which has been around since 1969 known by other names, also will work with EMC to piece together a hardware and software bundle that customers can use to better manage their data by tapping the power of computer grids.

The buyout of Acxiom technology is not EMC's first effort to bolster its grid expertise. It has gathered expertise in grids with the year-ago hiring of Ian Baird, CTO for Grid and Utility Computing Solutions (he had been with Platform Computing) and the hiring in 2004 of CTO Jeff Nick, who worked on IBM's On-Demand Initiative.

"The competitive big guys, such as IBM, Sun and HP, have already made plays in this space, so EMC needed to be able to have some expertise around grid computing," says Steve Duplessie, senior analyst for Enterprise Storage Group. "With [past EMC acquisition] VMware creating virtual machines, the next step is for EMC to offer a virtual data center."

Acxiom's software goes beyond VMware's, says Brian Babineau, an analyst for Enterprise Strategy Group. "It can be used to move information around so it can be analyzed and used more efficiently."

Under their agreement, EMC and Acxiom say they will develop a non-hosted software/hardware bundle called the Business Information Grid, for managing data. The firms pledge to deliver later this year a beta-product bundle that includes Smarts workflow automation technology, virtualization, information life-cycle management and grid-scheduling software, as well as secure access and authentication capabilities.

EMC has announced 13 technology or company acquisitions in the last 36 months. The latest was announced last week, when EMC bought Internosis, a firm that focuses on Microsoft applications. ■

A fast start

EMC has already bought half as many companies or technologies this year as it did last year.

Company	Acquisition date	Amount	Technology
Axciom	January 2006	$30 million	Business-intelligence middleware for marketing
Internosis	January 2006	Not disclosed	Microsoft service and support provider
Acartus	October 2005	Not disclosed	Data archiving software
Captiva	October 2005	$275 million	Converter of paper documents to digital
Maranti	August 2005	About $5 million	Intelligent Fibre Channel switch
Rainfinity	August 2005	$100 million	NAS aggregation appliance

Short Takes

■ **CA** has announced a reseller agreement with StoreAge Networking Technologies to beef up the virtualization and data-protection capabilities of its BrightStor storage-management software suite. The pact enables CA to fill a hole in its storage-area network product portfolio, according to Eric Pitcher, vice president, product management for BrightStor at CA. Under the terms of the nonexclusive agreement, CA is to resell StoreAge's cross-platform Storage Virtualization Manager appliance and its family of Multi data-protection software with BrightStor. CA will offer StoreAge's SVM as a stand-alone product or bundled with BrightStor, Pitcher says.

■ Data-migration vendor **PlateSpin** last week added support for Microsoft's Virtual Server 2005 Release 2 and Symantec's LiveState 6.0 to its PowerConvert software. The company's technology supports migration of data, applications and operating systems in physical, virtual, blade or mixed environments. The software is used for server consolidation, disaster recovery, hardware migrations and data-center optimization and relocation. Version 5.2 of PowerConvert also features support for multi-subnet and full duplex networks, new server-discovery tools and error reporting. PowerConvert 5.2 is available in three editions: Universal, Consolidation and Recovery.

More office apps squeezed into USB drives

BY JOHN COX

LAS VEGAS — Imagine carrying your office applications and data not in a heavy notebook computer but in a USB flash drive the size of your thumb.

That's the idea behind U3's smart drive, which now features a fuller software bundle, as announced at the International Consumer Electronics Show (CES) earlier this month in Las Vegas. The additional software adapted for the U3 platform includes two office suites, from OpenOffice and ThinkFree, the Maxthon Web browser and the Yahoo toolbar.

Also at the show, SanDisk and PQI released USB drives based on the U3 platform. These and other vendors take the U3 software, a subset of the available U3-compatible applications and varying amounts of storage capacity, package them on the thumb-sized drive and brand them with the U3 logo.

U3, in Redwood City, Calif., was founded as a joint venture in late 2004 by two flash-drive vendors, SanDisk and M-Systems. Unveiled at CES a year ago, U3 and its partners introduced their first flock of products last September.

The basic idea behind the smart drive is identical to Route1's MobiKey (www.networkworld.com, DocFinder: 1742), released last month.

In both cases, the drive is plugged into an open USB port on a Windows PC or laptop. The on-board software creates a protected space in which to run the stored applications, entirely separate from the operating system of the "host" computer.

U3 supports Windows XP and Windows 2000. When the drive is plugged into the PC, a logon screen appears. Once authenticated, the user sees a small U3 GUI, called the Launchpad. It's a series of buttons on the left for the applications stored on the drive, and on the right for navigating and managing the drive. Applications can be set to load automatically once the logon is completed. One button links to the Web-based U3 download site, where applications tailored for the U3 platform are available.

The OpenOffice suite (DocFinder: 1743) is the open source version of the original applications developed by StarOffice, a German company acquired by Sun in 1999.

ThinkFree Office (DocFinder: 1744) is a set of Microsoft Office-compatible desktop applications written in Java.

The Maxthon browser (www.maxthon.com) repackages Internet Explorer and adds an array of features, including a tabbed user interface; built-in RSS feeds; and blockers for ads, pop-ups and ActiveX controls.

SanDisk's new U3-based flash drives will range from 512MB to 4GB and priced from $50 to $300. They will be available in March. Four programs are included: Skype for VoIP, Avast Antivirus software, SignUp Shield password vault and CruzerSync, which synchronizes with Outlook data.

PQI's U3-based CoolDrive is available in 512MB, and 1GB and 2GB formats, bundled with McAfee Anti-Virus, the Migo PC synchronization application, Thunderbird e-mail and the Usafe program for password protection. Prices were not disclosed. ■

APPLICATION SERVICES

Short Takes

■ **Mercury Interactive** signed a definitive agreement to acquire privately held **Systinet** for $105 million in cash, with the hopes that the deal will boost its position in the fast-growing service-oriented architecture software and services market. Mercury software is designed to let organizations calibrate their IT initiatives so that they support business activities; Systinet's software lets organizations keep a record of application components and maintain control over them.

■ **EIQnetworks** last week announced it has enhanced the security and compliance-management capabilities of its information and event management software, **Enterprise Security Analyzer Version 2.1.** The software gathers data across security and network devices and includes compliance reports custom-designed to meet multiple regulatory auditor requirements. New to ESA 2.1 is support for eEye's Retina scanner, Internet Security Systems' vulnerability scanners, a Cisco-specific collection tool Cisco Security Agent and Cisco's NetFlow and C-Flow protocols. Pricing for ESA starts at $8,000, which includes a license for five devices and five hosts (Windows, Linux or Unix). A 50-node enterprise deployment starts at around $25,000. A 100-node enterprise deployment starts at around $50,000.

■ **Adobe** last week acquired the **FileLine Digital Rights Management** division of Navisware, and expects to add the technology to its LiveCycle Policy Server this fall. The software allows companies to control who can access documents saved in PDF, Microsoft Office and CAD formats as well as how and when they get access. In addition, the software creates an audit log of who has opened documents. Terms of the deal were not disclosed and pricing was not announced.

E-comm goes contactless

Banks, credit card companies and retailers jointly embrace wireless.

BY ANN BEDNARZ

Season ticket holders can now use a cell phone to purchase items at concession stands in Philips Arena, home of the NHL's Atlanta Thrashers and the NBA's Atlanta Hawks. With the right gear in place, all a patron has to do is wave a phone at a transaction terminal, and the sale goes through.

Contactless payments are creating a buzz in the retail world. The technology lets consumers make purchases without establishing a physical connection between the payment device — plastic card, key fob or mobile phone — and the point-of-sale (POS) terminal. Account information is encrypted and transmitted wirelessly between the payment device, which contains an embedded smart chip and antenna, and the reader.

Early adopters are deploying contactless terminals to simplify payment processes in settings with high volumes of low-cost transactions, such as gas stations, convenience stores, fast-food restaurants and sporting arenas. In these places, cash transactions are often the norm.

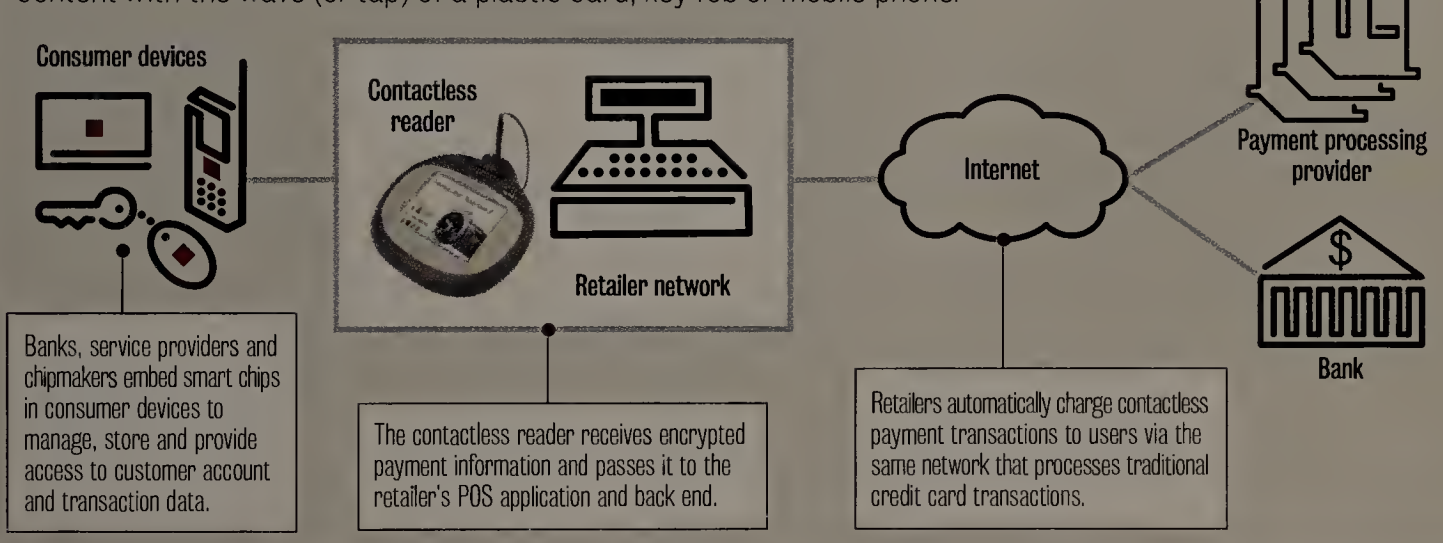
That may change as the contactless payment industry grows.

"Contactless payments make the payment process easier and more convenient for consumers, who see benefits of shorter

See Commerce, page 24

Wave-and-go shopping

Contactless payment technology lets consumers make purchases or download content with the wave (or tap) of a plastic card, key fob or mobile phone.



Microsoft wins over retailer Target

BY ELIZABETH MONTALBANO, IDG NEWS SERVICE

Microsoft last week unveiled a deal to outfit Target retail stores in the United States with server, database and development software that will run all areas of store operations.

Under the terms of the deal, which is part of Microsoft's Smarter Retailing Initiative, Target will migrate its 1,400 stores in 47 states from its current mishmash of legacy systems to Microsoft infrastructure, including Microsoft .Net Framework 2.0, Windows Server 2003 and Microsoft SQL Server 2005, according to Tom Litchford, director for Microsoft's retail and hospitality industry unit.

Minneapolis-based Target currently uses Microsoft software and Unix technology to run point-of-sale, back-office, inventory cash management and shelf-audit applications; the migration to a Microsoft environment began late last year with Microsoft and Target working together on the project, Litchford says. The companies expect to deploy the new technology in phases through the end of 2009 or early 2010, he adds.

Lena Michaud, a Target spokeswoman, confirmed that the company's U.S. retail stores are in the process of a migration to a Windows/.Net infrastructure, but she says that the company can't disclose further information.

Microsoft launched the Smarter Retailing Initiative two years ago this week on the advice of its partner and customer advisory board, which recognized a significant opportunity to help companies in the retail sector migrate from legacy systems to Web-services-based technologies, Litchford says. Microsoft's partners said they did not know how to target retailers specifically and asked for help from the software company, he says.

Microsoft worked on the initiative for 18 months, coming up with what Litchford describes as a "prescriptive architecture" for how independent software vendors could provide their applications on top of Microsoft software for retail companies. ■

NET INSIDER

Scott Bradner

Blocking the power of the Internet

The Internet succeeded because no one in the traditional telecom industry believed in its underlying technology or its design philosophy. They still do not, but are being backed into a corner, and in response are trying to change the Internet into something that they can better control.

Executives from AT&T, which was the U.S. telecom industry at the time, were present at the first major demo of the ARPANet in 1972. The ARPANet, like its successor the Internet, was a connectionless packet-based network — a technology that few in AT&T believed would ever be useful. According to Ethernet developer Bob Metcalfe, the executives were pleased when the demo crashed. Two years later AT&T turned down the offer to run the same ARPANet. A few years later the International Organization for Standardization, one of the major standards-development organizations for the traditional telephone industry, turned down a formal offer to adopt TCP/IP as basis for future telecommunications.

AT&T was happy to sell wires to the silly geeks building these packet-based networks, but saw no future in such technology. This attitude meant that the Internet was left alone by the telecommunications industry. It also was largely left alone by U.S. regulators — until quite recently.

This neglect meant that developers were free to experiment with new applications over the Internet. There was no carrier telling users what applications they could or could not run, no carrier that you had to get permission from before you were able to deploy a new Internet-based service. The Internet was just a collection of wires, most of which were bought from the telephone companies by ISPs, who paid what the telephone companies determined was a reasonable fee for use of the wires. The cost of the wire did not depend on what Internet services were running over it, just like the cost of your car does not depend on whom you transport in it. ISP customers paid the phone companies for the wires and paid ISPs for Internet service based on the size of the wire they were using — everything was simple.

But some of the telephone companies want to change this. They want to charge Google and others to send packets to you. The fact that you have already paid for the wire and the Internet service that Google is using to send those packets is ignored. The phone companies currently say that they want to let Google pay more to make Google's packets get to you "better," but this is the blunt end of the camel well into the tent.

The only way for the telephone company to get Google to agree to pay again for what its customers have already paid for is to threaten, directly or indirectly, that if Google does not pay, its packets will not get to its customers. It's a very small step for the telephone company to refuse to transport — or to badly impair — traffic from companies or people that have not paid the phone company an extra fee. It would be rather hard to innovate under these rules. In most situations this is called extortion, but the phone companies are asking us to believe that it's a service improvement.

Disclaimer: Extortion is not a normal Harvard course topic (as far as I can tell), so the above view is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Commerce

continued from page 23

lines, cash-on-hand issue elimination and faster moving queues," says analyst Erik Michielsen, who is director of RFID and ubiquitous networks at ABI Research.

"Merchants benefit by increased average bill size, greater throughput, less cash handling and increased return visits," he adds. "Card issuers and associations benefit by tapping into the cash market and increasing top-of-wallet positioning against competitors."

With much to gain, merchants and card issuers have been working together with vendors that supply POS gear. For example, the project now in its pilot phase in Atlanta required cooperation from many parties, including Atlanta Spirit — parent company of the Hawks, Thrashers and Philips Arena — Cingular Wireless, JPMorgan Chase, Nokia, Philips, Visa USA and Vivotech.

During the pilot, season ticket holders can make contactless payments at concession stands and access mobile content. At checkout, patrons hold their phone near a secure reader, which receives the credit card payment information and processes the transaction in the same way it handles other card transactions.

To participate in the pilot, patrons need a Visa credit account issued by Chase, a Cingular Wireless account and a Nokia 3220 mobile phone outfitted with a semiconductor chip from Philips and POS software from Vivotech. These strict requirements limit participation. That's one of the reasons Bob Egan, director of emerging technologies at TowerGroup, calls the Philips Arena project in Atlanta "a science experiment."

For the most part, the technology is still in its infancy. There have been some highly publicized projects in Europe and Asia, and now projects are getting attention in the United States, Egan says. It's a complex undertaking, and people are trying to test the waters with some minimum investment, he adds. "Contactless payment systems on credit cards and on mobile phones are going to be a significant growth hormone to accelerate the velocity of money," Egan says. But it won't happen overnight.

The challenge is combining two emerging industries — contactless payments and mobile phone systems — in a beneficial way. Collaboration is critical.

"Everybody needs to get around the table and understand their roles and responsibilities. They need to be very objective and heads-up about understanding the complexities of implementation and integration, and put some good policies in place around execution governance — understanding who's doing what, when, where and how," Egan says. Risk management becomes a really big deal, he adds.

Search for standards

Despite the hurdles, the consumer payment systems industry's Nilson Report estimated last May that there will be between 15 million and 20 million Visa and MasterCard contactless chip cards in the market by the end of 2006. Card issuers have launched several high-profile projects in the last 12 months: Last May Chase announced its "blink" contactless consumer cards, based on the Visa and MasterCard contactless payment technologies, which it's rolling out in Atlanta and Denver. Last August Citibank announced its plan to roll out 2.5 million contactless MasterCard debit cards and key fobs across the country. Last fall, MBNA started issuing MasterCard cards that can be used in Seattle's Qwest Field and Baltimore's M&T Bank Stadium. In addition, American Express has begun issuing Blue Cards with contactless payment technology nationwide.

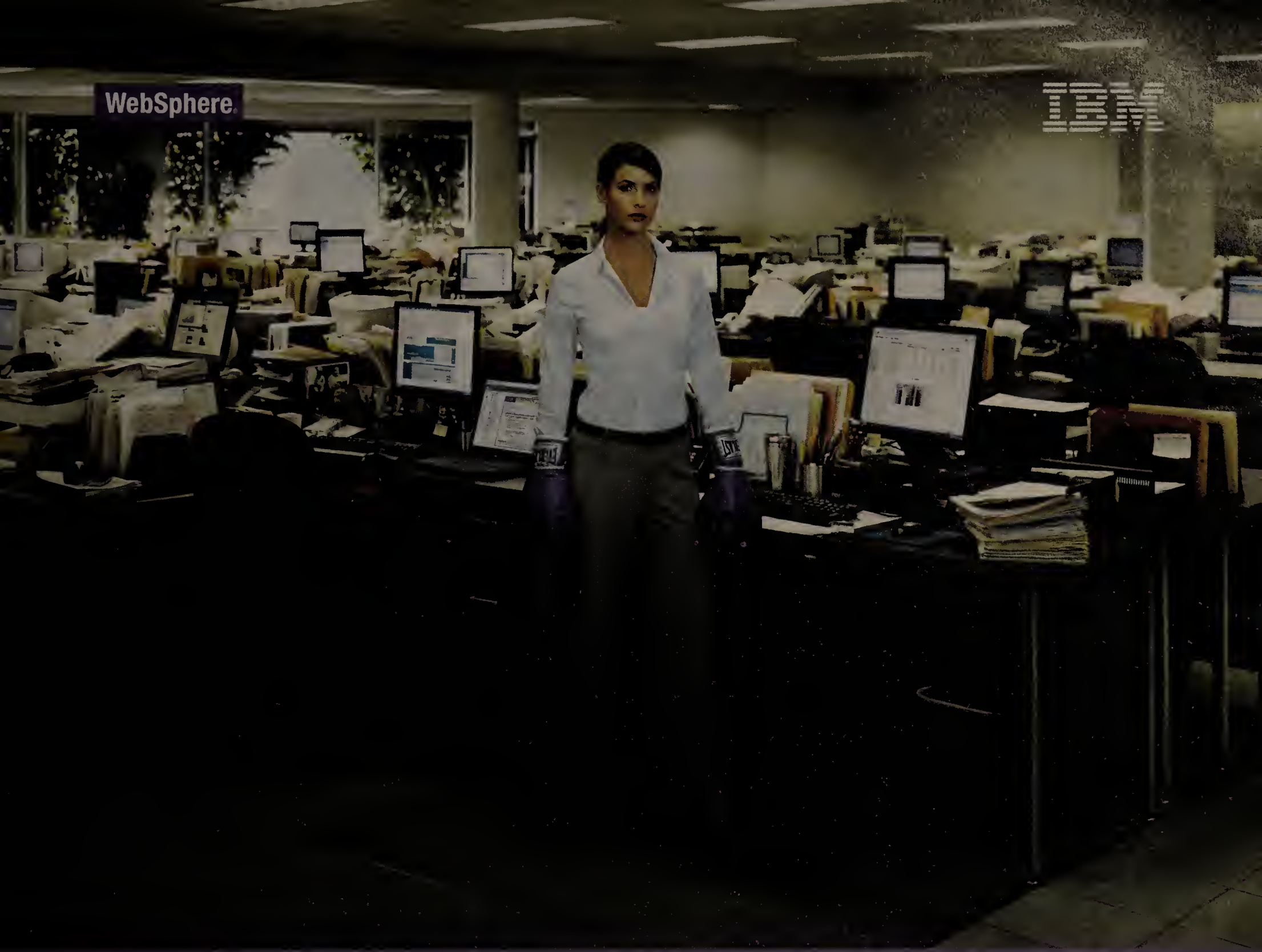
IT vendors working on contactless POS options include Hypercom, Ingenico, On Track Innovations and Vivotech. Among the retailers that have been experimenting with contactless payments are 7-Eleven, AMC Theaters, CVS, McDonald's, Regal Cinemas, Ritz Camera, Subway and Wawa.

From the beginning, the major credit card companies have been developing their own services for processing contactless payments: American Express has its ExpressPay, MasterCard International has PayPass and Visa has its Contactless products. Each is based on ISO/IEC 14443, the international standard for contactless smart chip technology.

Lately, however, these companies have been working to share technologies. Last March, for example, MasterCard and Visa announced an agreement to share a common communications protocol and associated testing requirements for contactless payments. The protocol is based on MasterCard's PayPass ISO/IEC 14443 implementation specification, says Cathleen Conforti, senior vice president and PayPass global product manager at MasterCard. "The use of a common protocol for conducting contactless payments will enable vendors to streamline product development and testing, leading to reduced implementation costs and faster time to market for financial institutions and merchants," Conforti says. As standards emerge, retailers will be able buy POS gear knowing it will be able to handle contactless payment transactions for multiple credit-card providers. Vendors will have to develop and support only one communications specification, making the manufacturing process easier and less costly, she adds.

At the same time, MasterCard, Microsoft, Motorola, Nokia, Sony, Visa and other companies are backing a wireless communications protocol called Near Field Communication (NFC). NFC technology is based on or compatible with existing ISO standards, including ISO/IEC 14443. One hallmark of NFC is its short range — a couple of inches.

That's one way in which contactless payment devices differ from radio frequency identification (RFID) tags used in supply-chain settings. For security reasons contactless payment devices are designed to operate close to a POS terminal. RIFD tags have a less-restricted read area and typically contain only an item identification number that's linked via back-end systems to more-detailed supply-chain data. In the big picture, it's not just purchases that the NFC network will enable: For example, backers envision that consumers will be able to download a movie or song clip by holding an NFC-enabled phone in front of a billboard or poster with an embedded NFC tag. As such deployments take off, more than 50% of mobile handsets will incorporate NFC chips by 2010 to enable short-range transactions, ABI Research predicts. ■



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SPECIAL FOCUS MANAGING THE DATA CENTER

Better management through best practices

BY DENISE DUBIE

The good news about adopting best practices is that corporations aren't limited to one method. The bad news is that companies will most likely need to adopt more than one best-practice framework — or at least parts of many — if they want a complete, effective set of management process guidelines.

A related concern is that when network managers realize that multiple standards may be required to achieve their goals, they may become overwhelmed trying to discern the differences among popular frameworks.

Best-practice frameworks such as IT Infrastructure Library (ITIL) and Control Objectives for Information and Related Technology (COBIT) have been around for years. For the most part, these frameworks should bring consistency and efficiency to the various aspects of IT, such as application development, help desk, network operations, security, and service delivery and support. Compliance with the Sarbanes-Oxley Act and numerous other regulatory standards is another obvious benefit — and is often the impetus for IT executives to start looking at process frameworks.

Other — and perhaps longer-term — gains are the cost cuts and labor reductions that result when an IT shop deploys processes to which all staff members adhere. Best-practice nirvana occurs when IT is able to align with business by helping network managers translate their services into business terms and assign a business-relevant priority to their tasks.

According to Forrester Research, best-practice frameworks will see broad adoption in 2006. The firm suggests that in many cases, ITIL and COBIT — along with the Capability Maturity Model (CMM) and ISO 17799 — should be adopted in concert. ITIL addresses service delivery and support; COBIT covers the broadest spectrum of IT governance; CMM, which is used frequently by application developers, shows how IT shops rate in terms of maturity compared with best-known processes; and ISO 17799 proposes security management measures.

"Most of these frameworks are not mutually exclusive and are most effective when used in combination with one another," says Craig Symons, a principal analyst with Forrester in a report released this month. "The road to a comprehensive IT governance framework involves understanding the differences among the frameworks and when to apply each framework."

Which frameworks an organization starts with depends on its goals. Many industry experts say even though ITIL is quickest to deliver incremental results, COBIT is a good place to start. COBIT can help IT shops prove they are performing the processes laid out in the other frameworks, as it is a common tool for auditors.

"COBIT is focused on governance, and if you are a higher-level IT manager concerned with overall corporate governance, this is the best place to start," says John Worthington, an independent ITIL consultant based in Denville, N.J. "If you are purely focused on IT and have a specific area to control, you may start with ITIL, but it's likely the two initiatives would come together eventually."

Brian Childers, an independent IT service management consultant and a board member with the U.S.-based IT Service Management Forum (which supports ITIL standards), adopted COBIT reluctantly during an IT process implementation at Earthlink, a previous employer. A big supporter of ITIL's tenets, Childers didn't want to explore the possibility of linking his process plans with those of COBIT. "I was adamant that I didn't want COBIT," he says. "But there was a gap in our plans to roll out two ITIL processes — change and release management — and COBIT addressed the hole because it provided specific audit guidelines that mapped directly to what auditors want."

He says that Earthlink was able to sign off on its Sarbox compliance in September 2004, a few months ahead of the December 2004 deadline, because the combination of ITIL and COBIT helped the IT staff to better define and then prove their processes were in place. "You can flat-out copy the COBIT guidelines and be golden, because that is exactly what the auditors are looking for," he says.

Lenny Monsour reports a similar scenario, in which the use of one framework — ITIL — led him to get certified in another, ISO 9001, a standard from the International Organization for Standardization (ISO) that defines the requirements for a quality-management system. Monsour, product management director at SunGard in Durham, N.C., started to put ITIL's change management processes in place about 18 months ago and found that by also rolling out an automation platform he could achieve ISO compliance as well.

"ISO demands pretty intense processes that are focused on quality and compliance," he explains. "ITIL gives you a loose guideline as to how to do change management, it's not specific. But with ISO 9001, you have to have your processes documented against your logs, and an auditor will check those against each other."

Two years ago Kent Joshi had an external consulting firm advise him to put best practices in place to govern IT operations at Washington Mutual Bank in Los Angeles. Joshi, the bank's IT vice president, soon realized the suggested processes, which laid out many fundamentals Joshi deems critical, still lacked the specific processes he would need to synchronize IT services with business demands. "We realized without a strong service-level management [SLM] process in place, we weren't instilling practices that addressed IT's interaction with our customers," he says.

Joshi says that before exploring the SLM guidelines, which ITIL lays out at a high level, his organization would have multiple IT staff people contacting customers, suggesting fixes for their problems. But without well-defined processes, the IT staff would provide only a piece of the necessary service and in a manner that couldn't be measured. The business unit would be left unsatisfied, and the IT staff would be left "scratching their heads" as to how their efforts didn't achieve the goal, he says.

"ITIL's SLM [process] places itself between the two areas: [It expresses] customer requirements in terms the business understands and in IT terms for my staff," he says. "And it helps you to figure out a measurable way to prove you delivered the services."

Despite the known benefits of frameworks, network managers should be wary of falling victim to "standards slavery," says Jon Vromat, a best-practice consultant with HP in Detroit.

"IT organizations often think they have to take it all on at once, and then [they] fail. Adopting frameworks is more like eating an elephant; to be successful, you have to do it in digestible chunks," he says.

Referring to best-practice frameworks as alphabet soup, Vromat says that managers should approach process adoption in three steps: Start with a framework, such as COBIT or ITIL; move on to a standard that can be certified, such as the many ISO guidelines; then perform ongoing improvements that could be measured by, for example, CMM or Six Sigma. ■

Best-practice grab bag

Process improvements can be made throughout IT departments, and experts advise IT managers to mix and match best-practice frameworks to address an organization's unique needs. Here is a sample of popular frameworks:

Best-practice framework	Origins	Most likely adopted by	Promised benefits
Information Technology Infrastructure Library	British government	Service support, help desk staff	High-level guidelines to start developing processes for IT service support and delivery across an enterprise.
Control Objectives for Information and Related Technology	Information Systems Audit and Control Association and IT Governance Institute	IT management, systems administrators, internal IT auditors	Standards and guidelines for security practices and financial controls, which sync up well with Sarbanes-Oxley requirements.
Capability Maturity Model	Carnegie Mellon Software Engineering Institute	Application development team	Process improvements such as change and release management across the application life cycle, from development to production.
ISO 17799	British Standards Institute and the International Organization for Standardization	IT security managers	Approach to security management across an organization that includes policies, critical-asset classification and risk management.

SERVICE PROVIDERS

Short Takes

■ **AT&T** announced last week that it is adding a number of bells and whistles to AT&T BusinessDirect, the company's portal for customer service management and trouble reporting. Among the new attractions are a "click-to-chat" feature that allows customers to chat online with a human being, as well as an expansion of the portal's graphical network map to 88 more countries. BusinessDirect has been an important component of the company's so-called Concept of Zero effort, the crux of which is to reduce the person-to-person and person-to-computer steps needed to make things happen.

■ **Skype Technologies** has completed testing the latest version of its Internet telephony software with a new video feature and is now encouraging users to download it. Version 2.0 of Skype's widely used VoIP software is available for free. It also allows users to organize their contacts by creating groups, such as colleagues, friends and family, and provides new buttons to display their Skype status on their blog or Web page. Currently, the software is available only for computers running Windows 2000 or XP. The new video feature requires XP.

FDA turns to Verizon for VoIP rollout

Cost savings, collaboration determine setup for new Maryland campus.

BY CAROLYN DUFFY MARSAN

If you're planning a move to a new office building and wondering what type of network infrastructure to build, consider the experience of the U.S. Food and Drug Administration.

The FDA is building a campus in Montgomery County, Md., which will house 8,000 employees in 18 new buildings. For its White Oak Campus, the FDA chose a converged IP network, with VoIP in all offices and conference rooms.

The FDA selected VoIP because it will cost less money to move employees from one location to another as they complete projects. The agency also hopes its new network will foster collaboration, with features such as unified messaging and desktop videoconferencing.

"We saw that VoIP was cost-effective if you're building a new building," says Glenn Rogers, deputy CIO. "With a legacy infrastructure, you have to pull the cables out of the building and redo the network."

The FDA will spend $25 million in eight years to build out the VoIP infrastructure. This cost includes all equipment from the VoIP phones back to the wire closets.

"The FDA project is one of the larger VoIP projects in the federal government," says Ray Bjorklund, senior vice president of Federal Sources, a market research firm. "Many agencies have pilot projects. But I haven't heard a lot in the government about people embracing VoIP yet for full agencies because of the security risks and the operational risks."

The FDA began planning its White Oak Campus in 1998, with a goal of encouraging collaboration on a consolidated campus. Previously, the FDA had buildings scattered around the Washington, D.C., metropolitan area.

Considering a VoIP rollout?

Glenn Rogers, deputy CIO of the Food and Drug Administration, offers the following advice:

- Choose an integrator that not only understands VoIP but also understands how to integrate it with your legacy infrastructure.
- Make sure your integrator understands how to build in redundancy.
- Get management buy-in for your project because there are going to be bumps in the road. The FDA's pilot users included the CFO, commissioner and key stakeholders, including people whose job it is to answer phones and set up conference calls.
- Be prepared to change your processes and procedures. Your data and telephony staffs have to talk. Consolidating IT staff and help desk is a big part of being able to successfully support this environment.
- Plan thoroughly. The FDA knew what it wanted to do upfront and what services it wanted to bring on campus before it brought in a single IP phone.

The FDA's CIO office is responsible for the data, voice and video services for the new campus. Rogers says he and his staff had several goals.

"It had to be state of the art, but not cutting edge or bleeding edge. It had to be something that would carry us for 20 to 25 years," Rogers says. "We wanted it to be adaptive, so we wouldn't have to rip it out when new technologies like IPv6 come down the pike. We wanted it to support agency standards and conform to our architecture. But the big thing was to remove IT boundaries within the different organizations within the FDA."

The FDA's eight organizations, including the Center for Drug Evaluation and Research and the Center for Devices and Radiological Health, had their own IT staffs and were developing and supporting their own systems and applications. In

See FDA, page 32

Banner year expected for convergence

BY CAROLYN DUFFY MARSAN

ISPs agree that the big news of 2006 in their market segment will be network convergence. The idea has been discussed for years, but companies are finally buying high-powered IP networks that can handle data, voice and video.

"IP convergence is happening in all companies, large and small, global and domestic. They're all looking to IP to add value to their business," says Mack Treece, president of Equant Americas. "I see this trend really taking off in 2006."

With converged networks come additional managed services — security, messaging, collaboration and more — that carriers hope will gain popularity in the months ahead.

"You'll see lots of add-on services for what people bought" last year, predicts Rose Klimovich, vice president of VPN and Integrated Networking at AT&T. "So for VoIP and video over IP services, now we'll see videoconferencing and voice conferencing over the Internet become bigger as we get into the year."

Another area that's expected to grow is managed security services that companies can use to keep their converged networks safe from attacks.

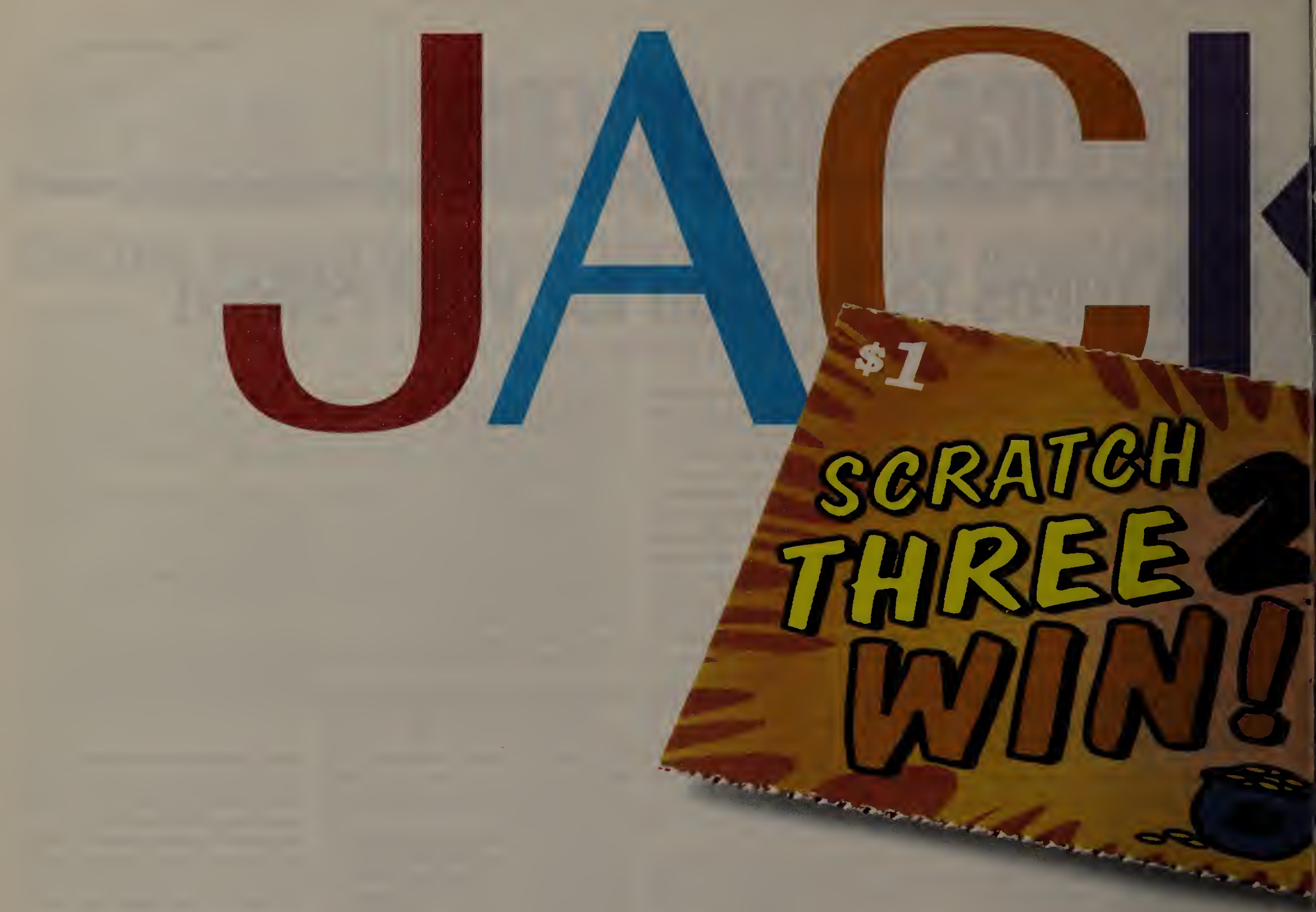
"The big news for 2006 will be around VoIP and the security impacts of that," says Chris Sharp, vice president of MCI's NetSec Security Services. "As more and more companies adopt open systems, VoIP and soft clients, we'll start to see a lot of vulnerabilities and threats in that area."

Carriers also predict more outsourcing as companies become concerned about the growing complexity of their converged networks.

"I see in 2006 that people will become more and more confident about outsourcing network security to a company like us because we have a proven track record," Sharp says. "They can get more features and functionality while keeping costs low with outsourcing."

Other technologies on the horizon include IPv6, the long-anticipated upgrade to the Internet's main communications protocol. Equant sees IPv6 gaining ground in production environments in Europe by the end of 2006.

"We are seeing companies begin to use IPv6 to expand the reach of their IP infrastructures into any piece of machinery they have or to add value via wireless monitoring so they're able to make sure they know the locations of various pieces of equipment," Treece says. "We've seen some innovative applications being created that will be in production in the later part of next year." ■



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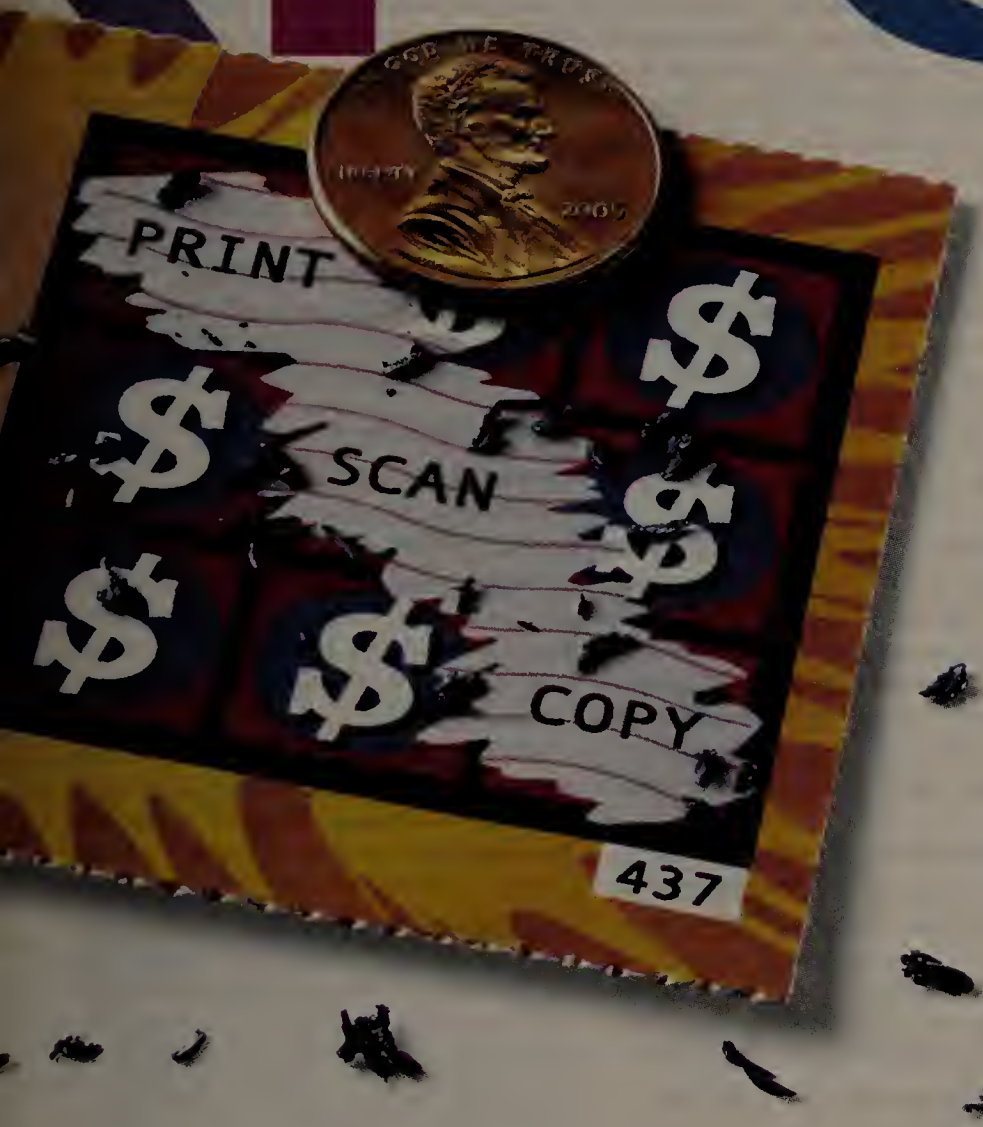

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EYE ON THE CARRIER
Johna Till Johnson

A final look back at '05 prognostications

Every now and then, even we industry pundits call it right — or so it seems. Comparing my 2005 predictions with the actual outcome, here's how the predictions fared:

2005 prediction: The telecom sector rebounds.

We're not talking about a repeat of the 1990s frenzy — think steady, incremental growth.

According to JMP Securities, a leading research and investment banking firm, the telecom sector grew an estimated 7% last year, and U.S. IT spending in general was up around 10%.

The interesting part is where the growth came from. Many bellwether public companies saw their evaluations stay flat or decline in 2005: AT&T (formed by the merger of AT&T and the former SBC) and Cisco both stayed flat.

Nortel rose slightly on the news of its new CEO but otherwise was mostly flat. Verizon and Juniper actually dropped by about 10%.

So if the growth didn't come from the bellwethers, where did it come from? In a nutshell, alternative players, particularly those focusing on the critical areas of VoIP, security, management and managed services. Enterprises are serious about these areas, and they're willing to spend money on alternative providers that can meet their needs. For example, 75% of the companies I work with said they were working with, or willing to consider, second-tier carriers.

Several private firms experienced a banner year in 2005, including ShoreTel Communications, Brix, Masergy Communications and Megapath. Among public alternative companies, Foundry rebounded nicely in the second half of 2005, ending the year up 27%.

Bottom line: A solid hit.

2005 prediction: Wireless broadband emerges.

Check. For just the most obvious example, Verizon and Sprint have made significant investments in EV-DO, and HP and Lenovo recently announced EV-DO-enabled laptops and notebooks. Stay tuned. This segment gets bigger still.

2005 prediction: MCI goes out of business.

OK, not really. . . . While I believe MCI will survive the year in some form or other, its long-term prospects are bleak.

As we saw, MCI became part of Verizon at the end of 2005. Admittedly, I didn't predict the SBC-AT&T deal — but it's worth noting the SBC-AT&T relationship has functioned more like a merger than a takeover.

2005 prediction: The FCC gets serious about regulating "Internet dial tone" (arrgh!).

Once again, a winner — the FCC's E-911 regulations hit in late 2005, and as noted in last week's column, they've finally awakened to the 21st century (not that it's a good thing).

2005 prediction: Convergence gets bigger.

Last year, for the first time ever, enterprises I worked with reported that the primary reason for investing in VoIP was "to future-proof networks" — the first time that business driver topped "cost savings" as a goal. This year we'll see the emergence of VoIP-based collaborative applications.

Five for five. Then again, even a stopped clock is right twice a day.

Johnson is president and senior founding partner at Nemertes Research, an independent technology research firm. She can be reached at johna @nemertes.com.

FDA
continued from page 29

recent years, the FDA has consolidated all IT under the CIO's office.

"Whatever we did at White Oak, we were not building eight data centers," Rogers says. "We knew we would have one data center and that we would have to realign our business practices and tech staff to support technology across the campus. The main purpose of the campus is to foster collaboration so that the agency can work more efficiently."

After research and a pilot project, the FDA decided that VoIP would be ready for a production rollout in 2005, when the first buildings at the White Oak Campus were due for completion.

The FDA issued an RFP for the campus network in 2002. Four companies bid, and the FDA chose Verizon, which partnered with Apptis and Batelle to offer a Cisco VoIP network.

"Verizon was able to bring to bear its expertise in the infrastructure, as far as LANs, WANs and connectivity coming in from the local exchange carries," Rogers says. "They could provide a really good picture about the end-to-end solution."

The FDA White Oak Campus is Verizon's largest VoIP project in the federal government.

The FDA "is one of the few customers that has actually committed to the technology at this scale," says Daniel Felder, vice president of federal civilian sales for Verizon Enterprise Solutions Group. "It's relatively easy to do the integration in small pockets of 20 or 40 or 50 people. But it's the FDA's commitment to VoIP for everyone that stands out."

The VoIP system includes Cisco call managers, switches, handsets, conference room phones and monitoring tools. The all-Cisco approach was attractive to the agency because it was already standardized on Cisco equipment across its 250-plus sites worldwide.

"We didn't want to bridge two different technologies," Rogers says. "Whatever vendor we chose, we wanted a true end-to-end solution, from handsets to IP softswitches to IP [public switched telephone network]."

The FDA is not using VoIP services from its long-distance provider, MCI. The agency uses VoIP only for local calls on its White Oak Campus.

> "It had to be state of the art, but not cutting edge or bleeding edge. It had to be something that would carry us for 20 to 25 years."
>
> *Glenn Rogers, Deputy CIO, FDA*

Rogers says that VoIP was not more expensive than building separate data and voice networks on the new campus. The ROI for the VoIP deployment was in cutting the costs of moving employees from one location to another.

"When we looked at the cost to do adds, changes and deletes from the system, the agency was spending $50 per person on that piece of it," Rogers says. "With VoIP, a person can move across the campus for free and just take their PC with them. With a traditional phone system, we would have to place an order with the local carrier to have a phone number moved or established, which was a four- to six-week process. Just from that perspective, we saw savings."

The FDA moved 2,000 employees from its Center for Drugs into four new buildings at White Oak last fall and says it has already saved money with its new VoIP system. The Center for Drugs has had three reorganizations in recent months, with hundreds of people moving to different offices. The new VoIP system has handled these changes with ease.

"Because we're a regulatory agency in the health sector, we regularly have new initiatives that cause the agency to have to create a new organization with staff and move people around," Rogers says. "With VoIP, we essentially become our own phone company, and that in itself provides a lot of flexibility. We can customize or add new call groups. We have a lot more functionality to do that, and we can do it in-house without having to work with a local carrier."

The FDA sees many other advantages to its new network infrastructure at the White Oak Campus, including tighter security and new features.

"We have a lot more control over the ports," Rogers says. "We have a lot more ability to lock down the network from a security point of view. We really wanted to ensure that we had a lot more management capabilities than we had with the legacy infrastructure."

In terms of features, the White Oak Campus network lets employees have an IP softphone installed on their laptops, so that they can receive calls while on the road or working from home. The network also supports videoconferencing in special rooms and at the desktop.

"We have 40 conference rooms in the buildings, and they are constantly booked," Rogers says. "So people can do videoconferencing on the desktop. We provide video on demand to the desktop so people can do training, too."

Rogers says the biggest challenge in designing the White Oak Campus network was ensuring redundancy. He says the agency was concerned about losing voice communications in the case of an IP network outage.

"We built in custom redirects, so that if VoIP has issues, we can redirect to cell phones or another phone number at the choice of the user," Rogers says. "We placed analog phones in key, common areas so if we did lose VoIP we still had analog services for emergency purposes."

To ensure redundancy, the FDA purchases voice services from two local exchange carriers, and it provides redundant and uninterrupted power supplies in its wiring closets.

The FDA is pleased with the performance of its new VoIP system, which performed well recently when a backhoe took out a trunk on the new network.

"We could have had a major outage," Rogers says. "But we built a self-healing network, so our users never noticed. We had that repaired in two weeks, but the users never knew we lost a major part of our fiber-optic ring on campus." ■

TECHNOLOGY UPDATE

■ AN INSIDE LOOK AT TECHNOLOGIES AND STANDARDS

AJAX accelerates Web applications

BY ALEXEI WHITE

As IT increases its dependence on Web-based systems to deliver business applications, it sacrifices end-user productivity and real-time updating of information. Web browsers have always been good at delivering software to remote users inexpensively, but they haven't offered the rich-client functionality of desktop applications.

Enter AJAX (Asynchronous JavaScript and XML), a Web development technique that uses tools built into most Web browsers that enable rich-client interactivity and real-time data micro-updates, or incremental updates, without the need for proprietary plug-ins. AJAX consists of three building blocks: JavaScript (or ECMA Script) for computation, Dynamic HTML for presentation and XML HTTP for client/-server communication.

The key component of AJAX is XML HTTP, which allows a Web page to communicate quickly with a server after it has been downloaded to a client browser. This is a dramatic departure from the traditional page-based model, which requires that an entire Web page be reloaded for the information to be communicated between the client and the server.

While seemingly simplistic, AJAX opens doors for Web-application developers that had previously been shut. It relies on nothing but the built-in browser internals. No extra software needs to be distributed to users, making AJAX an attractive option for companies that are concerned about the security and logistical implications of distributing installed software to users.

The traditional Web-application architecture (sometimes referred to as the postback model) is inefficient because it wastes communications bandwidth. Every hyperlink activation or button-press results in a postback (or reload) of an entire Web page, when perhaps all that was required was a tiny block of text from the database. AJAX solves this problem with XML HTTP.

Using XML HTTP and JavaScript, a developer can make an asynchronous request for a block of information from a server without needing to reload an entire page. The result is Web applications that react more quickly to user interaction.

For example, a user might want to see the details about a customer in a Web page. In a traditional Web application, the user might have to click and wait for the entire page to refresh before seeing those details. In an AJAX model, the user could click on the customer's name and have the data retrieved instantly from the server, then displayed directly on the Web page.

XML HTTP also addresses the data timeliness problem of traditional page-based application models. As soon as a Web page containing some data is downloaded to the browser, it is considered "stale," or out of date. The browser has no idea whether that data on the server has changed or is still accurate. This is a concern especially if a Web application has many concurrent users. Using AJAX, it's possible to check that data is current before a user needs it.

All major browser platforms now support AJAX, including Internet Explorer, Mozilla FireFox, Netscape, Opera and Safari. There's also a move toward standardization of XML HTTP, the core component of AJAX. Last year the World Wide Web Consortium formed a Web API working group to develop a specification for HTTP functionality (which covers, in part, AJAX). This is happening now in large part because of overwhelming response from the IT community in support of AJAX.

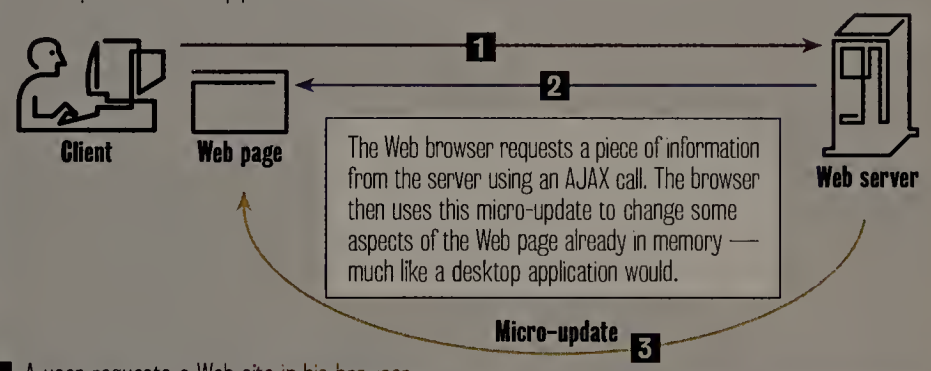
Performing targeted information updates, or micro-updates, can substantially reduce network loads, in addition to faster interaction with live data. Benefits can be measured through total bytes transferred, total download time and steps/seconds to complete a task.

The increasing relevance of AJAX is most obvious when looking at high-profile offerings, such as Google Maps and Salesforce.com, but what isn't obvious is that it's quietly making inroads in large and small companies. Its rapid adoption signals a shift in the way enterprises will build and deliver future Web applications.

White is a product manager for eBusiness Applications Ltd. He can be reached at awhite@ebusinessapplications.ca.

HOW IT WORKS: AJAX

The AJAX model uses asynchronous communication to perform targeted, or micro-updates on application data.



1. A user requests a Web site in his browser.
2. A Web server returns the entire page with JavaScript code embedded in it.
3. JavaScript code embedded in the Web page performs an AJAX request, loading new data from the server in real time.

Got great ideas?

■ *Network World* is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Senior Managing Editor, Features **Amy Schurr (aschurr@nww.com).**

Ask Dr. Internet

By Steve Blass

I have an Apache server running a number of named virtual hosts that I want to use SSL with. Apache doesn't support named virtual hosts in the SSL configuration file, because of the way the protocols work. I need to route requests by hostname using SSL. How can I do that?

Apache cannot support named virtual hosts in SSL host configuration files, because it cannot see the hostname header when the SSL request is being processed. You can use a directory-level configuration file, typically called .htaccess, to redirect the request, because the host name information is available at that later point in the processing. To do this, include the line "AllowOverride Options FileInfo AuthConfig" in the general configuration section of the apache httpd.conf server configuration file. This allows you to use the Apache URL rewriting engine from a directory-level configuration file. In the directory defined as DocumentRoot in the <VirtualHost_default:443> section of the Apache SSL configuration file, create an .htaccess file containing three lines: "RewriteEngine On" followed by "RewriteCond %{REQUEST_FILENAME} ^.*$" and "RewriteRule ^(.*)$ http://%{HTTP_HOST}:80/$1 [P]". This will send the decrypted SSL request to the host named in the http headers by proxy so that your users see only the https URLs. Depending on how your sites are named, users may see security warnings that your SSL certificate does not match the hostname.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

GEARHEAD
INSIDE THE NETWORK MACHINE

Mark Gibbs

DSL techs and favorite tools

If you have followed our travails with our DSL connection, we have an update for you: We asked for a technician to come and check out the DSL line, and last week an SBC DSL engineer, Todd 370, showed up.

But before we fill you in on what he found, we must digress to share a few tips about how to deal with SBC DSL support. To get to knowledgeable support people in double-quick time, hit "#" in answer to every question in the SBC interactive voice response (IVR) system. This annoys the IVR system and it will give up quite quickly and route you straight to first-level support.

SBC's first-level support is utterly useless unless you are a complete newbie with nothing more complicated than a basic PC hanging off the DSL modem, so you should immediately demand second-level support. Do not get wimpy here — insist on being transferred.

The first-level tech will ask you for information that won't be passed on to the second level, and so far we have found no way to avoid this step. Even so, this strategy will reduce the time it takes to get to second-level support to around eight minutes.

Anyway, back to Todd 370. He turned up, took a look with his DSL test gear and concluded that something was degrading the signal on our side of the demarc. Our DSL setup was delivered with three or four Z-filters (in-line high-frequency filters) to filter out the DSL carrier, and so we installed them on each phone on that circuit.

Apparently there is voodoo involved, because this really was at least part of our problem. Todd 370 installed (for the princely sum of $35) an industrial grade Z-filter next to the demarc and tightened all of the connections (apparently, slightly loose terminal screws can cause serious problems), and when he retested the connection, its performance was significantly better. So far, so good.

> What we wonder about is the maintainability of this technology.

(But how is a consumer supposed to know any of this? There are no instructions we can find on the SBC site regarding the placement of Z-filters, and you know the telephone support techs are clueless on the topic.)

Then we went inside and ran some Pingplotter traces and found errors were still appearing. On the first hop the latency was periodically jumping from 10 millisec to 1.5 seconds or more, and the jitter was increasing from 0.4 millisec to around 400 millisec! Todd 370 suggested the problem might be the DSL modem so we installed a new one, but nope, the errors were still there.

So now we wait for a visit from another engineer who specializes in wiring and who will, so we understand, check the cabling from the demarc to the pole and then to whence it comes — presumably all the way back to the DSL access module.

What we wonder about is the maintainability of this technology. If Ethernet were this complex, unreliable and hard to diagnose, local area networking would still be in the dark ages of ProNet and Token Ring.

We're supposed to be wiring the country, creating a broadband-connected culture to gain the benefits of an always-on, always-connected, high-speed communications infrastructure, but it appears we're still in the sacrificing-a-chicken-before-we-turn-it-on stage.

More after the cabling wizard puts in an appearance.

As we don't have a lot more space, we'll conclude this column with a request for your favorite tools and utilities. We just had to rebuild a PC that had creeping Winrot, and we found ourselves reinstalling certain tools that we knew we couldn't live without.

For example, Process Explorer from Sysinternals, a serious replacement for the Windows Task Manager, and Irfanview, an amazing file viewer and player that can understand and display a remarkable number of formats (see www.networkworld.com, DocFinder: 1745). And how would we get anything done without Vim for editing files, and the command-line wget (DocFinder: 1746) or the GUI-based FileZilla (DocFinder: 1747) to get files?

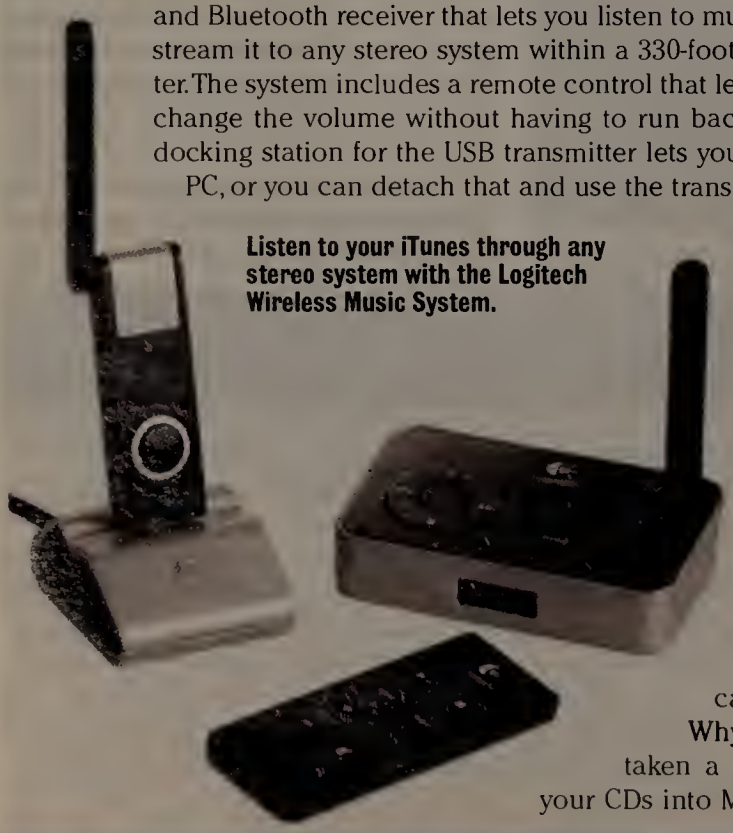
So, what's in your tool chest? Inventories to gearhead@gibbs.com.

CoolTools

Quick takes on high-tech toys. **Keith Shaw**

The scoop: Wireless Music System for PC, about $150, from Logitech

What it is: The Wireless Music System is a USB transmitter and Bluetooth receiver that lets you listen to music stored on a PC and stream it to any stereo system within a 330-foot radius of the transmitter. The system includes a remote control that lets you change songs or change the volume without having to run back to the original PC. A docking station for the USB transmitter lets you connect to a desktop PC, or you can detach that and use the transmitter with a notebook PC. The transmitter connects to the PC with the stored songs via USB, and the receiver connects to a stereo system via composite audio cables (you also can connect to a portable speaker system via a stereo headphone jack, but you'll need to buy a separate cable).



Listen to your iTunes through any stereo system with the Logitech Wireless Music System.

Why it's cool: If you've taken a lot of time to transfer your CDs into MP3 format, or if you've caught the wave of the 99-cent song download from iTunes, you have a lot of songs on a PC but can only play them on that PC (or your iPod). Playing the songs on a better stereo system becomes difficult, especially if you want to play a specific playlist that you've built. Existing products intended to let you listen to music stored on a PC on a separate stereo system require a networked media player or other device that connects via wired Ethernet or wireless (802.11b/g) network. Since the system is basically acting like an extended set of speakers and it runs over Bluetooth, you don't have to do any wireless configurations (especially security).

A bonus of the Logitech Wireless Music System is that it will play any of your purchased iTunes Music Store songs (or other DRM-purchased songs) on the stereo system. Another advantage: If you've been using iTunes to listen to Internet radio, you can stream the feed from your PC to the stereo system.

The Logitech system also is scalable; additional receivers (priced at $80 each) can be connected to other stereo systems in your house. The USB transmitter can support as many as 16 receivers. Included software lets you control what room and receiver the music plays in (although if you get to this point, you might just want to invest in a multiple-room system such as the Sonos Digital Music System).

Some caveats: The $150 price tag seems a bit high when you consider it's about the same as similar networked media players that also let you view photos or movies over a regular network. Still, an uncomplicated setup and configuration makes it worth the cost. The Bluetooth system also may interfere with any existing 2.4-GHz networks, but there is a button on the back of the receiver that lets you switch between a variable frequency range to one that's fixed.

Grade: ★★★★ (out of five)

Shaw can be reached at kshaw@nww.com. Check out a new Cool Tools Video Show (including a demonstration of the Logitech Wireless Music System) every Thursday at www.networkworld.com/video.

"SUNGARD REHEARSED SCENARIOS WITH US A COUPLE OF TIMES A YEAR. SO WHEN KATRINA HIT, I KNEW OUR DISASTER RECOVERY PLAN WOULD WORK."

— Harold Aucoin, COO
Gilsbar, Inc.

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On Technology

John Dix

Soft tokens at the new Interop show

The first East Coast Interop since 2002 bowed in in New York just before Christmas, and while small by Interop standards, was focused and decently attended.

The show featured about 100 vendors vs. the 270 that showed up in Las Vegas last May, but was conspicuously missing the support of longtime backers Cisco and Microsoft. Anchoring the show floor were Foundry and AT&T, with other large booths taken by APC, CA, Extreme and HP.

Vendors expressed mixed reactions about attendance levels; some were pleased to see buyers from big local companies, while others said attendance was too light. There were, however, many interesting technologies on display.

One company on the show floor that was telling an interesting story was Diversinet, which was talking up its software-based two-factor authentication technology.

A core rap against two-factor authentication based on hardware tokens is the cost of deployment and management, which puts it out of range of any company looking to use the technology to secure communications with consumers.

Diversinet's MobiSecure soft tokens, on the other hand, are generated by a small application that can be deployed to cell phones, PDAs or even Windows-based PCs, says Wally Kowal, vice president of marketing.

In use, the MobiSecure tokens are employed the same way as hard tokens. When users log on they are asked for a password and the code generated by their token (the second factor). The algorithm on the user's device creates the one-time code by combining a secret client credential (loaded during provisioning) with a sequential counter. The validation server knows the credential and sequence for that given client and, if it generates the same code, grants access.

After the session ends, the sequence number is incremented so that code can never be used again, Kowal says. The sequencing is the primary difference between MobiSecure and hard tokens from companies such as RSA Security, which keep the validation server and tokens in sync at all times.

Diversinet's technology is compliant with the reference architecture for strong authentication from the Initiative for Open Authentication (OATH). Launched in 2004, OATH (see www.openauthentication.org) is backed by companies including IBM Tivoli, VeriSign and Citrix.

Although they might not be as secure as hardware technologies, the market for soft tokens such as MobiSecure has to be much larger. This is interesting stuff that we can expect to hear more about when Fall Interop arrives back in New York on Sept. 18.

— John Dix
Editor in chief
jdix@nww.com

Opinions

CP80 not censorship

Regarding Mark Gibbs' BackSpin column "Putting lipstick on the Internet porno-pig" (www.networkworld.com, DocFinder: 1734): I don't understand Gibbs' problem with the CP80 initiative. CP80 isn't suggesting banning any content from the Internet; it is an innovative proposal to create a way to filter content. Simple firewall configuration would allow you to make sure that questionable Web sites can't be accessed by your child or at your company. The main problem I can see would be compliance. Everything is already on Port 80 — how hard would it be to separate all of the questionable content out now? Perhaps a revision is needed, such as marking a different port as clean and only letting approved content use that channel. But I don't see how censorship would be the major drawback, since it's entirely up to the user whether or not to block other ports.

Steve Pritchard
Clarence, N.Y.

Misnomer

Christopher Sloop's defense of WeatherBug (DocFinder: 1737) is well written and certainly serves to dispel some common myths about what the product does in the background. However, I think the perception of WeatherBug is not helped by its moniker: Most IT professionals will be loath to install any software product that has "bug" in its name.

Paul Lourd
Greenwich, Conn.

Wowed by wikis

Regarding your feature "The wild world of wikis, Weblogs, podcasts and RSS" (DocFinder: 1735): Wikipedia is not the original wiki, and your story creates the perception that big, public examples like Wikipedia are the way wikis work. Most wiki activity is being done behind enterprise firewalls or on personal server networks for small, independent groups. I recently posted my thoughts on this subject and the misperception that tech media and business media are creating when it comes to wikis (see DocFinder: 1736).

Kris Olsen
Consultant and blogger
Cincinnati

Delivery not bug-free

In "What's behind on-demand software's rise" (DocFinder: 1738), Ed Barrett of CareRehab states, "We don't want to invest in a lot of software. We have in the past and now it is shelfware because it did not work for a variety of reasons." I presume Barrett thinks if he gets software over the wire it will be free of bugs and work as advertised. My 20 years of experience tells me he is shortsighted at best and naive at worst.

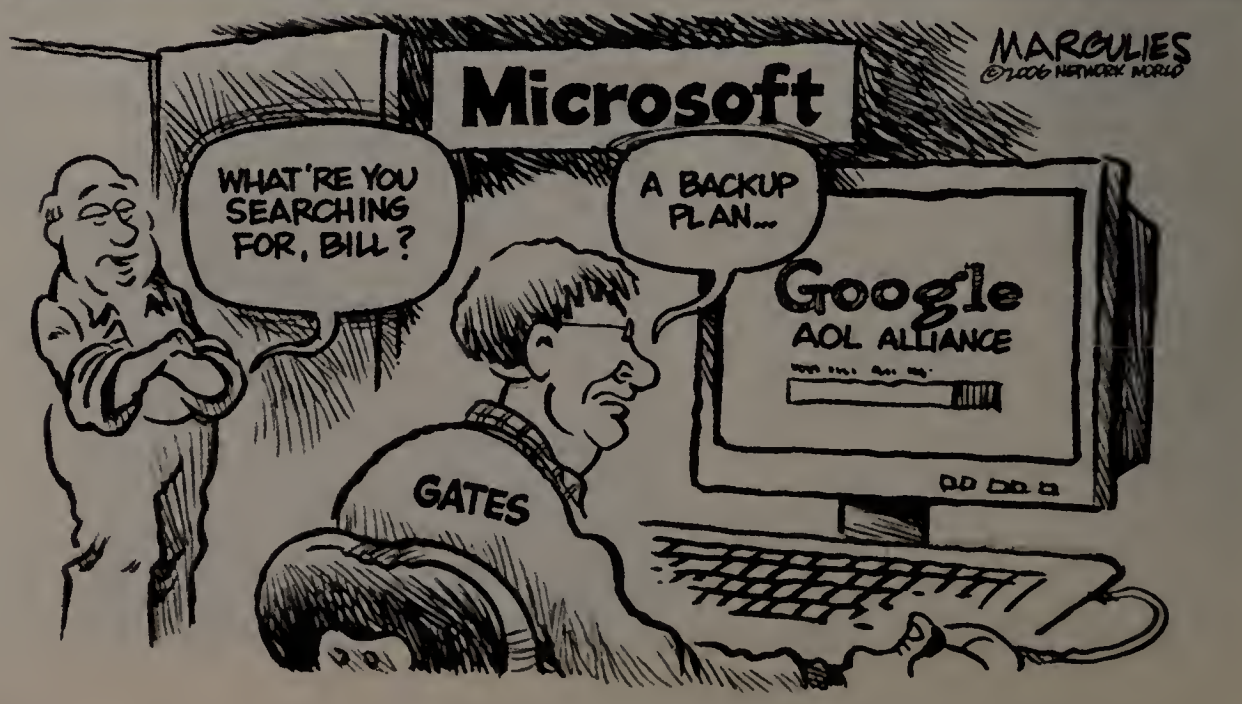
The delivery medium is not going to preclude what network administrators have known for years: Software vendors routinely sell software that does not work, does not work as advertised and does not work within critical subroutines of the software proper. It is rushed to market without complete testing, and the end user is the one who will end up on the wrong side of an application fault, much to the chagrin of the corporate bottom-line profitability. Software-as-a-service will only allow the delivery of this abuse at wire speed.

Rocky Habeeb
Microsoft systems administrator
James W. Sewall Co.
Old Town, Maine

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

nww.com **Readers respond**

Find out what readers are saying about these and other topics. **DocFinder: 1030**



USER VIEW

Chuck Yoke

Visit the IT SPA in 2006

With the start of another year, many IT professionals are completing their training plans. While most budgets have been set, there are still decisions to be made about the specific training to undertake. You may be evaluating a variety of technical training courses or industry certification options. While these have value, my recommendation is to add a trip to the IT SPA to your training for 2006.

"IT SPA" is my acronym for three skills that are critical in the IT world — straddling, planning and analysis.

In the past, technical skills and industry certifications were primary factors for career advancement in IT. The current focus on utility computing, outsourcing and offshoring, however, has begun to diminish the emphasis on engineering, programming and operations skills, which many organizations consider to be commodity items that vendors can provide. The value of IT comes from its overall business value rather than its technical value. Because of this, internal IT departments are becoming more business-facing and customer-focused than ever before. Skills such as relationship management (straddling), project management (planning) and business analysis (analysis) are fast becoming the basis for both job security and career advancement.

A variety of third-party vendors can run your data center and IT operations, but relationship management is an internal skill all IT departments need. Relationship managers meet with users and understand their business needs intimately. They work within the IT organization as a customer advocate, and concurrently work within the business to communicate the value of IT.

A dive into the IT SPA can invigorate your career.

With one foot in the business and the other in technology, they straddle the gap between the customer and IT.

Network and systems engineering also can be outsourced to third parties, but project management is needed in-house. Project managers ensure that IT projects and initiatives are completed on schedule, stay within budget and meet stated requirements. Knowledge of a company's financial budgeting, management and reporting processes are crucial to this role, along with an overall knowledge of team building, resource management, work scheduling and risk management. If relationship managers are the voice of the customer, the project manager is the voice of the business, ensuring that fiscal, timeline and functionality requirements are met.

Application development can be offshored, but in-house business-analysis skills are critical in making sure the applications perform as needed. Business analysts focus on business requirements. They meet with process owners to document requirements, translate the requirements into specifications the application development groups need and work with development teams to ensure the applications provide the needed functionality. They are the liaison between business process owners and application developers, ensuring that usable and productive applications are developed.

Just as a trip to a real spa is meant to invigorate the body, mind and spirit, a dive into the IT SPA can invigorate your career and provide bigger challenges, bigger rewards and hopefully bigger paychecks. Take time to visit it in 2006.

Yoke is director of strategy and architecture for a global travel and real estate company. He can be reached at ckyoke@yahoo.com.

TELECOM CATALYST

Daniel Briere

Moore's Law, Metcalfe's Law; now McGuire's

Russ McGuire is a really smart guy, the type of guy who does not think outside the box but rather about what the box should look like to begin with. He was chief strategy officer for TeleChoice back when the industry could support a smart guy sitting around thinking about where the telecom market was going to go next. Some of our best thinking has come from discussions with Russ, who is now deep in Sprint/Nextel's strategy organization.

In the course of a strategy project we were working on recently at Sprint/Nextel, we heard people talking about McGuire's Law and how it will impact the company's future direction. McGuire's Law is rather simple. When you speak to Russ, he'll talk humbly about the Law of Mobility (it's his compatriots that speak of it as McGuire's Law). The period from 1985-1995 was very much dominated by the massive impact of the PC on business — driven by Moore's Law, which states that computer processing power doubles every 18 months at the same price point. The period from 1995-2005 has been dominated by the impact of the Internet on business — driven by Metcalfe's Law, which states that the value of any network increases exponentially with the number of users.

Recent events have coalesced to bring us to a third period, the Age of Mobility. The integration of the Centrino chip into laptops has cemented the move to Wi-Fi everywhere. Cell phones have been taking off on their own accord, spawning products such as ringtones and fashion accessories. Until recently, McGuire notes that the cost of taking an object and having it talk to the network from wherever it was has been relatively expensive. Recent technological changes have pushed us over a new threshold, however, and now the value of adding mobility to any product outweighs that increased cost. That's the tipping point.

So we're now in the Age of Mobility, governed by the Law of Mobility. Thanks to cost reductions of Moore's Law, scalability resulting from Metcalfe's Law, convergence and miniaturization of devices and increasing ubiquity of 3G wireless networks, the cost of making any product (especially one involving information) available all the time is plummeting. Therefore, McGuire concludes, just as computing power and the Internet have been built into virtually every product, mobility is beginning to be built into every product.

Recent events have coalesced to bring us to a third period, the Age of Mobility.

The Law of Mobility states that the value of any product or service increases exponentially with mobility. McGuire points to the TV set. If one were to graph price vs. display size, with the $3,500 42-inch plasmas at one end, all the way down to the 5-inch, black-and-white handheld AM/FM units that you can get for about $30, then you'd think that a 2-inch screen on your cell phone would be worth about $20. Yet users will pay far in excess of this — including monthly and even per-show fees — to be able to squeeze in their favorite sitcom while riding home on the subway.

The key to the measure of mobility is the increase in the percent of time the product is available for use. A smartphone with Windows Mobile has a premium that approaches the cost of a desktop computer even though it has far less screen real estate, far less memory, virtually no disk space and poor excuses for Word, Excel and PowerPoint, but it's with you 100% of the time.

The challenge for IT is to figure out how to help your firm build mobility into products to add exponential value. You deployed the PCs during the Age of the PC; you networked everything you could during the Age of the Internet. Now, during the Age of Mobility, the strategic thinkers are asking, "What are you doing to mobilize your products on behalf of your company?" It's an IT manager's dream world.

More than anything else, what I like about the thinking around McGuire's Law is that it puts today's IT challenges into a framework that a board of directors can understand. They know Moore. They know Metcalfe. It's time for them to meet McGuire. You can check out his thoughts at www.networkworld.com, DocFinder: 1721.

Briere is CEO of TeleChoice, a market strategy consultancy for the telecommunications industry. He can be reached at telecomcatalyst@telechoice.com.

CLEAR CHOICE TEST Web front-end devices

Feeding the need for speed

With Web front-end accelerators, pick one: speed or scalability.

BY DAVID NEWMAN, NETWORK WORLD LAB ALLIANCE

Web front-end accelerators use a grab bag of techniques to speed delivery of content, including application-layer switching, HTTP compression and TCP multiplexing.

The problem is that Web front-end devices either make traffic go very fast for a limited number of users or handle a very large number of users — but they can run into trouble doing both at the same time.

That's the major conclusion of the industry's first comprehensive performance tests of Web front-end devices. For nearly a year, we benchmarked devices from leading vendors Array, Citrix, Crescendo Networks, F5 Networks, Foundry Networks and Juniper Networks.

Among our findings in this inaugural test:

- The benefits of application acceleration are real. Properly implemented, devices can speed delivery of content to users while simultaneously lightening the load for data-center servers.
- HTTP compression doesn't always reduce response time, and can increase it in some situations, even with highly compressible text objects and very low client access rates.
- TCP multiplexing can dramatically reduce network processing overhead on servers, by nearly 350-to-1 in one case.
- Some devices don't offload much TCP connection processing when users request pages quickly (as on e-commerce sites).
- Web front-end devices exhibit big variations in the maximum number of connections they handle and the maximum rates at which they move traffic.

As is often the case with any new market category, there are substantial differences in terms of form factor, topological requirements and supported features (see "One size doesn't fit all," at www.networkworld.com, DocFinder: 1725).

Because of those differences, and because this is a relatively new product category and no device aced all tests, we're not scoring products this time around. As our results clearly show, different Web front-end vendors have put their development dollars in different places (see vendor modules at DocFinder: 1726.)

Two products deserve special mention. Crescendo's CN5080-E is a screamer of a performer, turning in top results in many of our tests due to its use of custom hardware for content switching. And Citrix's NetScaler Application System combines high scalability with a rich application-acceleration feature set.

To the test

Although an earlier test compared Web front-end features (see DocFinder: 1731), the emphasis this time was on Web front-end performance.

Tests fell into two main areas. Services tests measured transaction rates and response times for a given number of users, both with and without HTTP compression applied, and with and without access control lists in place and distributed denial-of-service attacks underway (see services test results, page 39). Scalability tests demonstrated the limits of system perform-

INSIDE

ONLINE

Product-by-product breakdown, testing parameter explanation, test methodology outline, feature comparison.

www.networkworld.com
DocFinder: 1741

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NetResults

Product	TMX5000	NetScaler Application Delivery System 6.0	CN-5080E	BIG-IP 6800	ServerIron 450	DX 3600
Vendor	Array Networks www.arraynetworks.net	Citrix Systems www.citrix.com	Crescendo Networks www.crescendonetworks.com	F5 Networks www.f5.com	Foundry Networks www.foundrynet.com	Juniper Networks www.juniper.net
Price	$33,800	$52,500	$48,000	$66,000	$38,000	Single unit, $55,000; Four units, $220,000
Pros	High transaction rates; economical.	Highly scalable in tests of concurrent connections, goodput, TCP multiplexing with long think times; rich feature set.	Screaming performance delivers top placements in most tests.	Decent performer; rich feature set; good response-time reduction; highly scalable.	High port density; scalable (more than our results suggest); Cisco IOS-like command-line interface.	ActiveN feature allows multiple boxes to work together for scalability and high availability; four-box configuration is a strong performer.
Cons	Only one interface each for client- and server-facing networks vs. four for some competitors; compression cannot be applied selectively; no per-URL filtering.	Sensitive to transaction rates in TCP multiplexing and HTTP compression tests; only two interfaces each for client- and server-facing networks, vs. four for some competitors.	No support for caching, URL rewriting or IP subnet-based access control; routes rather than switches among interfaces.	In goodput tests, system design requires hundreds or thousands of users to reach top speeds.	No support at test time for HTTP compression; limited visibility for ICMP distributed denial-of-service attacks.	Limited horsepower on a single box; response time was sluggish until Juniper tuned memory settings.

ance in terms of maximum concurrent connection capacity, TCP multiplexing ratios and maximum forwarding rates (see scalability test results, page 42).

It's important to note that we're not claiming either set of tests represents "real-world" behavior for all users. There are too many variables in application load testing for a one-size-fits-all definition of that term to be meaningful (see "Your mileage will vary," DocFinder: 1727). Still, these tests offer useful comparisons in that we offered the same traffic at the same levels to each device tested.

Our test bed emulated as many as 2.35 million unique clients and 16 Web servers (see "How we did it," DocFinder: 1728). In some events, we pounded the devices with traffic at gigabit Ethernet LAN rates, pushing traffic at rates approaching 4Gbps. In other tests, we emphasized scalability in terms of large numbers of users or high transaction rates rather than focusing on high forwarding rates.

No device aced every event; rather, the results suggest different vendors optimized for different aspects of device performance. Some dramatically offload servers from the burden of TCP processing overhead, while others use HTTP compression to reduce response time. Devices also vary widely in terms of the scalability of connection counts and "goodput" rates, which reflect how quickly a device transmitted request HTTP object back to the client.

Faced with all these differences, the best advice we can offer in choosing a Web front-end device for your network is to assess which of these metrics matters most, and go for the box that delivers the biggest benefit in that area.

Thanks

Network World is grateful for the support of vendors that provided test bed infrastructure for this project. **Spirent Communications** supplied its Avalanche and Reflector 2500 traffic generator/analyzers as well as scripting and engineering support. **Apcon** supplied its Intellapatch 64 virtual patch panel and **Extreme Networks** supplied a Summit 7i gigabit Ethernet switch.

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The Web front-end name game

As with any new technology, there's considerable marketplace confusion surrounding these devices, starting with what they're called. We refer to these products as Web front-end devices because they speed the delivery of content from Web server farms to end users requesting that content. But they go by other names as well, including application accelerators, content switches and application delivery controllers. Terms with "application" or "content" in their names may be the most apt, because these devices handle many application types, not just Web requests.

Whatever they're called, these devices differ from conventional load balancers in many ways. New features include Layer-7 switching, TCP multiplexing, HTTP compression, URL inspection and rewriting, caching, SSL capabilities and surge protection.

Not all devices offer all these features, but the majority cover at least some. For a full breakdown of what each product has to offer based upon vendor responses to our survey, check out our online features comparison at www.networkworld.com, DocFinder: 1722.

The squeeze play is all part of the game

With compression, you'll win some and lose some.

BY DAVID NEWMAN, NETWORK WORLD LAB ALLIANCE

While scalability tests help to size a Web front-end device for a particular network (see scalability test results, page 42), services tests are arguably more important, because they more closely approximate application behavior.

In this series of tests, we measured transaction rates and response times for a given number of users, both with and without HTTP compression applied, and again with and without access control lists (ACL) in place and distributed denial-of-service (DoS) attacks underway.

The most contentious area of this project was the effect of HTTP compression on application performance (read about our attempts to get the right user mix to test compression at www.networkworld.com, DocFinder: 1723).

Compression seems like a simple enough idea: Put the squeeze on data headed to clients, and it will arrive faster. Because smaller compressed objects take less time to send than larger uncompressed ones, response times should fall and transaction rates may rise.

That's the theory, anyway. In practice, our results suggest compression is only effective under some circumstances. It takes time to compress an object, raising concerns as to whether the delay outweighs the bandwidth savings.

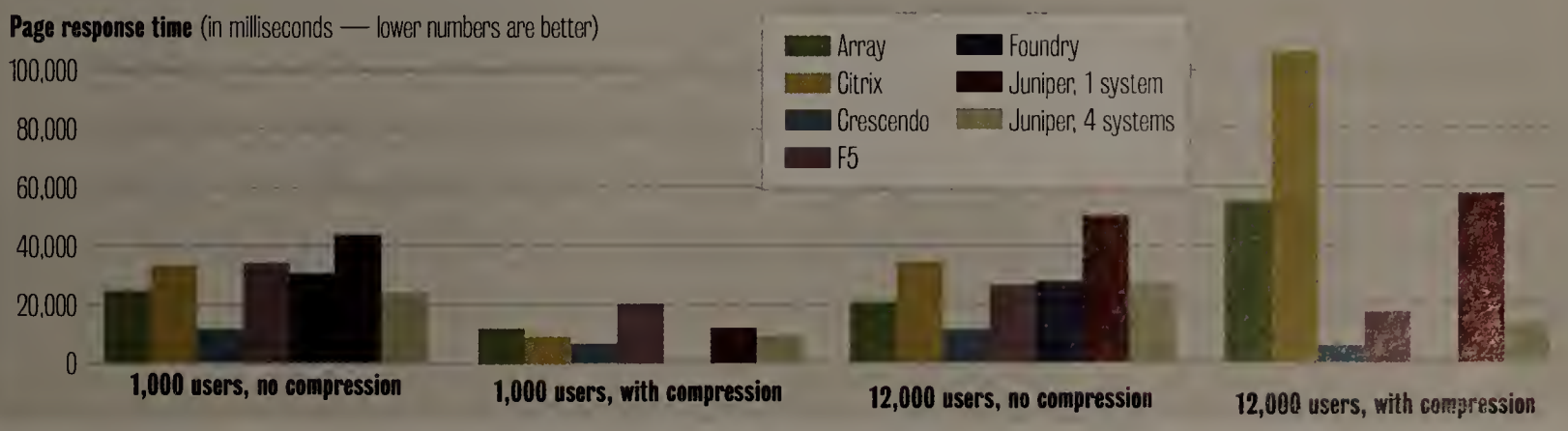
Typically, compression makes the most sense for clients with low-speed access, such as those coming in via dial-up or cable or DSL circuits. But add a little bit of LAN traffic to the mix, and compression benefits can disappear. Worse, in some cases HTTP compression degrades response time and transaction rates — even when only dial-up and cable or DSL users are present.

We compared the results of tests run with compression disabled and enabled. Spirent Communications' Avalanche and Reflector test tools offered the same traffic in both cases, and we measured transaction rates and response times to determine the effects of compression.

We ran the tests with two traffic loads: first with a 500KB text object, and again with the home pages from five popular Web sites — Amazon.com, the BBC, UCLA, the White House and Yahoo — along with all images and other objects from those pages. We chose the 500KB text object because (at least in theory) it was highly compressible, and the five-site test because it represented a more typical

Compression and response time with a 500KB text object

HTTP compression reduced response time for all devices handling 1,000 concurrent users, but it was a different story with 12,000 users. Although the Crescendo, F5 and Juniper four-box systems continued to reduce response time when we enabled compression, the other devices took longer to serve content with HTTP compression enabled than without it. Foundry Networks did not support HTTP compression at the time we tested its product.



mix of text, images and other content types found in production settings.

Foundry's ServerIron does not support HTTP compression, though the vendor says it plans to do so this quarter. We asked all other vendors to enable compression for dial-up and cable or DSL users.

We expected tests with 500KB text objects to show the biggest benefit from HTTP compression, but that was not always the case. As it turns out, getting any benefit from compression depends on transaction rates.

In tests with 1,000 concurrent users and relatively low transaction rates, all products showed significantly reduced response time when we enabled HTTP compression. Juniper's single-box solution edged out Citrix's device for the biggest reduction in response time, with both vendors delivering data more than 2.5 times faster with compression enabled. For users on low-speed lines, this is a very significant speed boost.

We added a 12,000-user test because there was relatively little differentiation among transaction rates in the test with 1,000 users. For all devices, rates for the 1,000-user tests hovered between 11 and 15 transactions per second regardless of whether HTTP compression was enabled. We don't necessarily expect HTTP compression to increase transaction rates, but the lack of differentiation suggests the test doesn't push any of the boxes all that much. A good benchmark should be stressful.

Ideally, response times for compressed and uncompressed data should have been about the same in the 1,000- and 12,000-user tests. Not only was this not the case, but in some instances response times were much higher with compression than without it.

The Array, Citrix and Juniper single-box solutions showed increased rather than decreased response times. Citrix's NetScaler Application Delivery System and Array's TMX5000 had the most trouble, raising response times by factors of 3.1 and 2.6 respectively. Just as the easier test sped up delivery of data, these results essentially mean a heavily loaded device would deliver data roughly three times slower.

Citrix supplied Version 6.0 of its software for testing but says Version 6.1, now generally available, produces a much lower response time. In internal tests, Citrix says, it sees response time fall from 34 seconds to 18 seconds when HTTP compression is enabled with 12,000 users; we did not verify this.

Not all devices struggled in this test. The Crescendo, F5 and Juniper four-box solutions all reduced response time by some degree, just as they did in the earlier tests. Crescendo's device did especially well here because of its use of hardware-based HTTP compression and forwarding, which made its response times among the lowest and most consistent across all tests.

Citrix representatives raised a number of objections to this test. First, they asserted that the Citrix device would have done much better if we had enabled both compression and caching. That's certainly plausible; caching would have freed up the Citrix box from having to fetch all objects from servers, and also might have given the device a chance to precompress objects. With caching, we might not have stressed the NetScaler Application Delivery System's compression engine nearly as much as we did. The Array, F5, Foundry and Juniper devices also support caching and might also have improved their results.

Second, Citrix representatives said the test was "not real-world" because no customer network has 12,000 users simultaneously requesting 500KB objects. That's correct, but misses a key point: Just as we test switches or routers with loads consisting exclusively of all small or large packets, the goal of an application load test is to describe limits of device performance. To find those limits, tests should be stressful.

Third, Citrix noted that the Avalanche client emulator does not cache objects, while a real browser would. Here again, browser caching would have considerably lightened the load on all devices, including the NetScaler Application Delivery System — and the test would have been considerably less stressful.

While there is merit to all of Citrix's objections, we don't see this as a torture test. Even with 12,000 concurrent users, transaction rates were still very low because of the low access speeds involved.

Citrix's device handled 130 transactions per second in the uncompressed test, and 65 transactions per second with HTTP compression enabled. In contrast, the Crescendo, F5 and Juniper four-box solution showed increased transaction rates with HTTP compression enabled. But even the fastest box — Crescendo's, with compression enabled — handled fewer than 200 transactions per second in this event. Further, all clients came in at rates of 1.5Mbps or less, and also waited 60 seconds between requests. Those are hardly the kinds of conditions we'd expect to lead to performance degradation.

We also used five Web sites' home pages to measure response times and transaction rates. In this test, there were 100,000 concurrent users active.

Because the home pages combine text with less-compressible or uncompressible objects such as graphics files, we expected to see a smaller difference between the uncompressed and compressed test cases.

That's generally what happened (see graphic below). With the 500KB text object, compression cut response time in half. With the five-site test, differences between the product results the latter in response time were more typically around 20% or 30% — still significant, but nowhere near as much as with highly compressible text objects alone.

Crescendo's device showed the greatest benefit in response time, but that's partially because its page response time without compression was relatively high. Even so, Crescendo's CN-5080E delivered the second-lowest response time in this test, about 400 milliseconds behind Juniper's four-box solution.

On the other hand, Juniper's single-box solution turned in by far the highest page and URL response times of any device tested. Further, a single DX 3600 showed increased response time when we enabled HTTP compression. Judging from its high CPU utilization during this test, the load of 100,000 users all asking for five home pages with more than 200 objects was simply too heavy a load for a single DX 3600.

Most of the other other devices weren't far behind the Juniper four-box and Crescendo devices, with page response times averaging between 20 and 25 milliseconds. In all cases except that of Juniper's one-box solution, response times improved with HTTP compression enabled.

We also measured transaction rates with the five-site load (see "Compression and transaction rates with five popular Web sites," below). The results were interesting in several ways. Unlike the 500KB text-object tests, there wasn't much difference between test cases with and without compression. That's not too surprising, considering that the amount of compressible data was a much smaller part of the total than in the 500KB text-object tests (where everything was compressible).

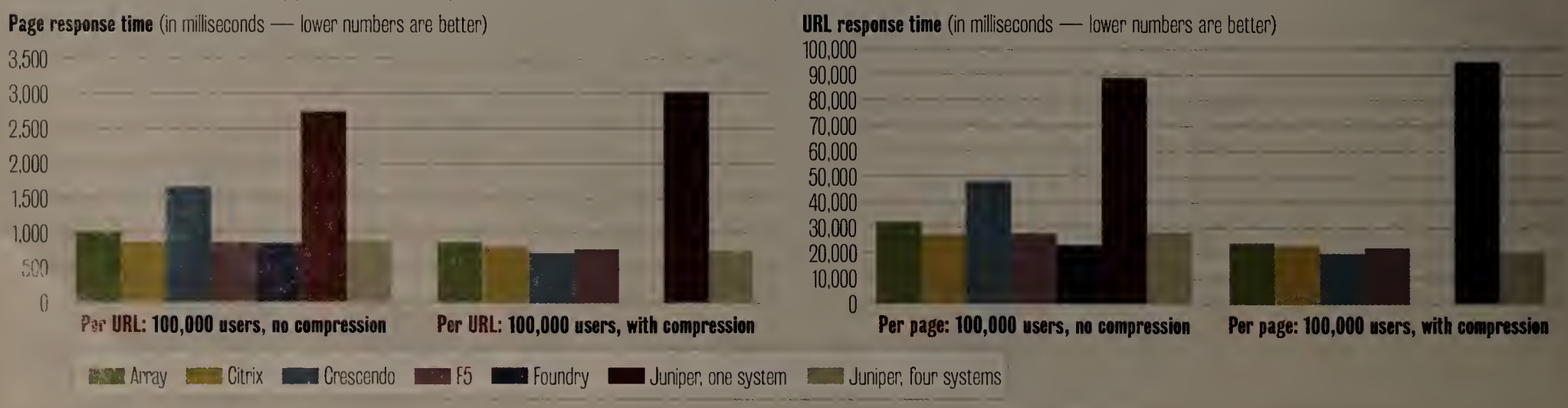
Strangely, transaction rates for Foundry's ServerIron in this five-site test were much lower than those of most of the other devices. Foundry also was puzzled by these results. As in other tests, we obtained higher rates when running earlier versions of ServerIron code. Most other vendors handled about 10,500 transactions per second.

We used results from the five-site tests as baselines for two other measurements: performance with ACLs applied, and

See Compression, page 42

Compression and response time with five popular Web sites

The effects of HTTP compression were less pronounced when handling the home pages from five popular Web sites — Amazon.com, the BBC, UCLA, the White House and Yahoo — than with pure text traffic. That's because these sites involve less-compressible or uncompressible content such as images. Foundry Networks did not support HTTP compression at the time we tested its product.



Compression
continued from page 40

performance while under distributed DoS attack. in both cases, the goal was to determine whether there was any performance penalty from either of these conditions.

In the ACL tests, we asked vendors to configure their devices with 20 access-control rules. Ten of the rules blocked traffic from IP subnets, and 10 blocked traffic headed to specific URLs.

Not all vendors were able to do this. Array's TMX5000 cannot block traffic to given URLs, so we instead applied rules denying access from 20 source IP networks. In contrast, Crescendo's CN-5080E supports only filtering on URLs; it cannot block traffic from given source subnets. In Crescendo's case, we used rules blocking access to 20 URLs.

We also asked vendors to configure safeguards against distributed DoS attacks, not only for this test, but for all tests we conducted. On the theory that "attackers don't make appointments," we did not tell vendors what attacks we would use, either before or after the test.

There was good news in both the ACL and distributed DoS results for all vendors. With ACLs applied, response times and transaction rates for all devices were virtually identical to their baseline numbers. At least with 20 rules applied, there doesn't seem to be a performance cost to ACLs for any device.

The distributed DoS results also were nearly identical to the baseline numbers, but this test did require changes on the part of a couple of vendors. Crescendo's system rebooted the first time we launched the distributed DoS attack, but a later (generally available) software release from the vendor corrected the problem. Juniper's systems also became unresponsive during this test until the vendor tweaked its memory management settings.

All systems informed us they were under attack, although with varying levels of detail. We used two attacks in this test, one based on TCP and another based on Internet Control Messaging Protocol. Foundry's ServerIron reported on both forms of attack, but we needed to delve down into a debug prompt to see whether the system saw the ICMP attack.

Speed traps

Scalability tests push Web front-end box limits.

BY DAVID NEWMAN, NETWORK WORLD LAB ALLIANCE

While our services tests assessed how well Web front-end devices handled application traffic, our scalability tests can help properly size one of these products for a particular network's needs.

The scalability tests demonstrated the limits of system performance in terms of maximum concurrent-connection capacity, TCP multiplexing ratios and maximum forwarding rates. In all these areas, the test results show big differences among devices.

In the maximum concurrent-connections test, our goal was to determine how many client connections a device could handle. There were major differences among vendors in this test.

To determine connection count, we configured Spirent's Avalanche to emulate as many as 4 million clients running Internet Explorer. Each client opened a TCP connection and requested a 1KB Web object from the Web front-end device's virtual one or more IP addresses (just as a single IP address for, say, www.amazon.com hides dozens or hundreds of servers, all these devices used one virtual IP address as a proxy for the back-end servers on the test bed).

After receiving the object, clients sat idle for 60 seconds before requesting another object over the same connection. This long "think time," how long a client waits before requesting the next page, allowed us to build up connection count. For all vendors, we kept adding new connections until the device failed to complete some transactions or until we reached 4 million connections, the limit of our test bed. Even though our goal was a Layer-4 measurement — the number of established TCP connections — we used Layer-7 switching in this and all other tests.

Citrix's NetScaler Application Delivery System set up 4 million concurrent TCP connections, the limit of our test bed (see "Maximum concurrent TCP connections," DocFinder: 1740). F5's BIG-IP was next, setting up about 3.5 million connections, followed by Foundry's ServerIron 450 with about 2.7 million connections.

Juniper's DX 3600 topped out at 2 million connections with four systems working together, and 500,000 concurrent connections on a single box. The vendor says its appliance has a hard-coded limit of 500,000 connections per system, something reflected in our test results.

The Crescendo and Array systems each sustained fewer than 1 million connections. Crescendo says its device has a hard-coded limit of 1 million connections, a few of which are reserved for internal use.

Foundry objected to our test methodology, noting that we were stressing a limit of the ServerIron's connection-establishment rate rather than its concurrent-connection capacity. Foundry says the ServerIron can set up more than 7 million concurrent connections when it handles connection-establishment requests at a lower rate, or with a longer think time between client requests.

We agree that rate and capacity are different variables, and ideally should be measured one at a time. Unfortunately, time constraints prevented us from rerunning these tests on all devices at a lower rate. The numbers we found are still valid, in that we tested all devices the same way, but we take Foundry's point that its number (and perhaps that of other devices) reflects connection establishment rate, not just capacity.

TCP multiplexing

Although every device in this test supports TCP multiplexing, the 300-fold differences in the devices' results clearly show that not all TCP multiplexing engines are built the same.

TCP multiplexing can offer a powerful performance boost by offloading computationally intense TCP processing from servers. It's such an important feature that we used it as one of two criteria, along with Layer-7 switching, that all devices had to support.

To measure TCP multiplexing, we configured the Avalanche test tool to set up and maintain 100,000 TCP connections from emulated clients. As in the tests of response time with and without HTTP compression, clients requested home pages from Amazon.com, the BBC, UCLA, the White House and Yahoo. We compared the number of client-side connections (always 100,000) with the number of server-side connections over 60 seconds to determine the TCP multiplexing ratio.

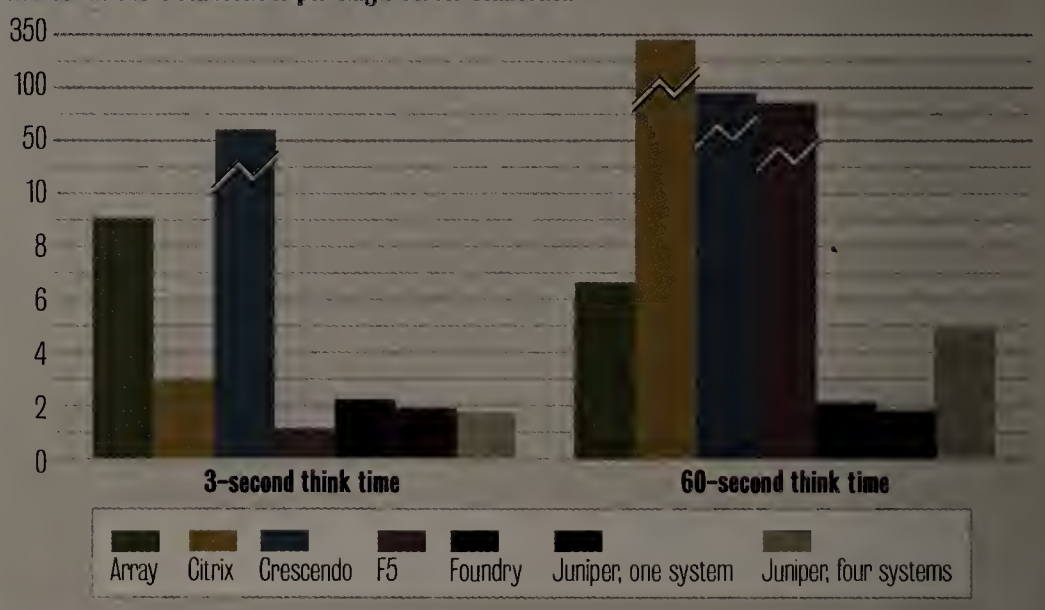
The ratio of client-to-server connection counts may be dependent on user think times. For some devices, think time has a huge impact on multiplexing ratio; for others, it barely matters.

We began with a 3-second think time. That may not sound like much of a delay, but it does reflect the fact that visitors to e-com-

See Scalability, page 44

TCP multiplexing efficiency

TCP multiplexing — the ratio of client-side to server-side TCP connections — may depend on "think time," the amount of time users wait between requests. The Citrix, F5 and Juniper four-box systems delivered much higher TCP multiplexing ratios with a 60-second user think time than with a 3-second think time. For most other systems, TCP multiplexing ratios were about the same, regardless of think time.



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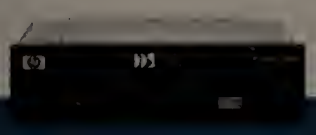

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Scalability

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merce sites tend to move through pages very quickly. One study of QoS for e-commerce sites conducted at the University of Wisconsin (www.networkworld.com, DocFinder: 1730) assumed an average think time of 2.5 seconds per page, just below the 3-second figure we used. (You can perform your own benchmark by observing how quickly you move through pages next time you shop online.)

We repeated the test with a 60-second think time, a more appropriate interval for Web pages containing lots of text. (If you're reading this online, consider how long it's been since you loaded this page.)

Most devices showed improved TCP multiplexing ratios with longer think times. The standout was Citrix's NetScaler Application Delivery System, which mapped 346 client connections onto each server connection when we used 60-second think times. That's a huge reduction in the workload for servers behind this box.

It was a very different story when we used a 3-second think time with the NetScaler Application Delivery System. The device set up just three client connections per server connection, a hundredfold reduction in TCP multiplexing efficiency compared with the 60-second case. Citrix says it normally delivers ratios much higher than 3-to-1 and cites as the culprits the lack of caching and the high transaction rates in our tests.

Crescendo's CN-5080E offloaded TCP connections by nearly 100-to-1 with a 60-second think time in place. The vendor was disappointed to see "only" a 60-to-1 offload with a 3-second think time. We're also unable to explain that result; in earlier tests with a different software release, the Crescendo box repeatedly set up 1,024 server-side connections regardless of think time (even with zero think time).

Foundry's ServerIron also delivered some mysterious multiplexing results. It had regularly set up TCP multiplexing ratios of 50-to-1 in earlier tests, regardless of think time. But after an upgrade of the ServerIron code, the ratio fell to slightly more than 2-to-1. Foundry was unable to explain the difference and was also unable to reproduce this outcome in its own tests.

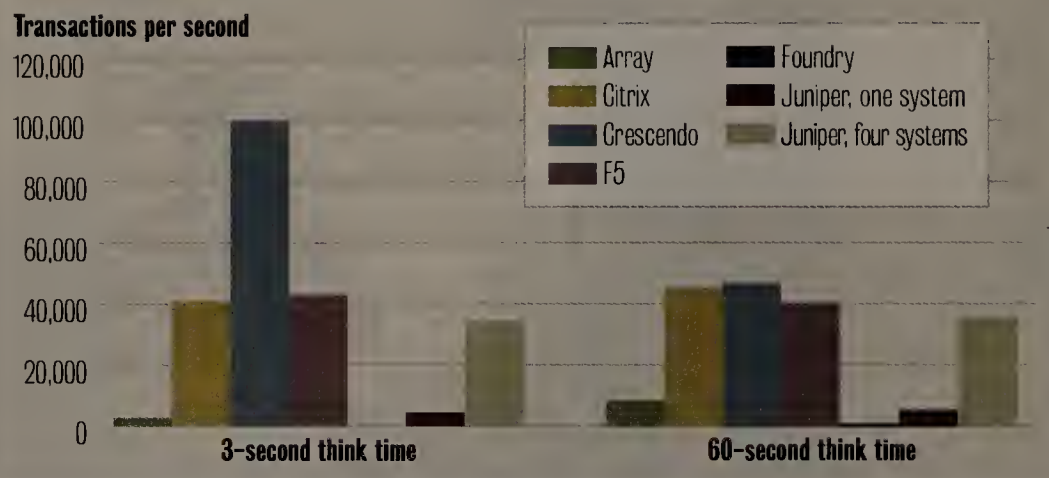
Other vendors showed relatively little benefit from TCP connection count. For example, Juniper's single-box results showed less than a 2-to-1 multiplexing ratio, regardless of think time. With four Juniper devices, the multiplexing ratio improved to 5-to-1 with a 60-second think time.

To understand why we saw such big differences in multiplexing ratios, it's helpful to see the rate at which each box handled transactions (see "TCP multiplexing and transaction rates," above). Note that emulated clients attempt to request objects at the same rate with all devices; thus, the differences in transaction rates are entirely a function of how fast each device responds. With the notable exception of Juniper's DX 3600, devices that processed transactions at a higher rate achieved higher TCP multiplexing ratios.

One caveat before leaving the topic of TCP multiplexing: Just because a device offloads TCP connections from servers in a 100-to-1 ratio, it doesn't mean 100 servers can be replaced with just one. Many other factors come into play, including server CPU and memory utilization, network utilization and application behavior. Even taking these factors into account, TCP multiplexing still can bring big benefits to beleaguered server farms.

TCP multiplexing and transaction rates

Even though we offered HTTP requests at the same rates to all devices, the number of transactions delivered per second (tps) was very different. Crescendo delivered the highest rates in tests with a 3-second think time. Foundry's ServerIron had a rate of 0 tps with 3-second think times; its transaction processing was very periodic, and we repeatedly observed zero transactions completed during the steady-state phase of the test. With a 60-second think time, all devices except Array's, Foundry's and Juniper's one-box solution ran at roughly similar rates.



HTTP Goodput

"Goodput" describes application-layer performance by measuring forwarding rate, minus any data lost or retransmitted. Crescendo posted the highest goodput of any device tested, but results for the Array and Citrix systems also are noteworthy, in that both devices came close to the theoretical maximums for their lesser number.

Vendor	Goodput in Mbps
No device (baseline, four interfaces)	3,804
Array (one interface)	963
Citrix (two interfaces)	1,900
Crescendo (four interfaces)	3,244
F5 (four interfaces)	2,594
Foundry (four interfaces)	1,588
Juniper, one system (one interface)	629
Juniper, four systems (four interfaces)	2,120

Not so goodput

Some of the devices tested have 16 Gigabit Ethernet interfaces or more, begging the question as to how quickly they forward data.

To find out, we measured each device's "goodput" — defined in RFC 2647 as the amount of data received minus any data lost or retransmitted. In the context of this test, goodput is a Layer-7 measurement, reflecting how quickly a device transmits requested HTTP objects back to the client.

We measured goodput by setting up 100 emulated clients, each requesting 1MB objects from servers behind each device under test. As in all other tests, we used different patterns in the URL for each object, forcing devices to make Layer-7 switching decisions.

We began with a baseline measurement with no device present to demonstrate the channel capacity of our test bed. The goodput in this back-to-back test was about 3.8Gbps, close to the theoretical maximum rate when factoring for Ethernet, IP, TCP and HTTP overhead.

None of the devices came close to the baseline measurement, but there are some mitigating circumstances (see "HTTP goodput," below). The Array, Citrix and Juniper single-box devices had fewer than four client and four server interfaces; thus, they could not achieve the same data rates as in our back-to-back tests. The Array and single-box Juniper entries each had one client interface; the Citrix device had two. Both the Array and Citrix results are much better than they look in comparison with four-interface boxes; both vendors' devices ran at the maximum rate possible given their interface counts.

Even so, we're a bit surprised that the devices didn't come closer to our baseline. The fastest box was Crescendo's CN-5080E, the only device to crack the 3Gbps line, because of its use of hardware acceleration for packet forwarding.

F5's BIG-IP was next fastest, with a goodput of around 2.5Gbps. The vendor says the BIG-IP's goodput partly depends on the number of clients it sees. F5 reran our tests internally with 1,000 and 10,000 users, and says it achieved goodput of as much as 3.2Gbps. We did not attempt to replicate this, but it does suggest that different user counts could affect goodput. (On the other hand, goodput topped out at around 25 to 30 users in our baseline tests with no device in line; any greater number of users had no effect, because the network was already saturated.)

Foundry's ServerIron 450 moved traffic at around 1.9Gbps, or about half the theoretical maximum possible, a result Foundry replicated internally. Unfortunately, our production schedule did not allow time for further examination. Earlier builds of ServerIron code delivered goodput of at least 2.7Gbps, and the vendor says it has achieved rates in excess of 3Gbps in its internal tests.

Juniper's four-box setup was the slowest of the systems with four interfaces. The vendor was not surprised by this result, and says it considers other acceleration features, such as caching and compression, far more important. We agree.

Goodput is a useful way to describe system capacity, but given that few if any users run their networks at maximum utilization, forwarding rates are probably less important than results of other tests. ■

Lab Alliance

■ Newman is a member of the Network World Lab Alliance, a cooperative of the premier testers in the network industry, each bringing to bear years of practical experience on every test. For more Lab Alliance information, including what it takes to become a partner, go to www.networkworld.com/alliance.

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E-MAIL NEWSLETTER SHOWCASE: STORAGE IN THE ENTERPRISE

iSCSI vs. Fibre Channel: The battle is on

BY MIKE KARP

Today and next week we will look ahead to more trends that we are likely to see in the New Year. At this point, it is time to make the obligatory comments about iSCSI and Fibre Channel storage-area networks . . . and about something else as well.

ISCSI vs. Fibre Channel has been an off-again/off-again battle for years now. Originally, the two were supposed to lock horns in a fight for the corporate IT SAN space. But iSCSI developed slowly, and it became obvious that the battle would come about later rather than sooner.

Then it looked like iSCSI would become the "SAN for the everyman", a less expensive and easier to use format that would work well for smaller businesses and departmental needs and which would leave Fibre Channel products to provide for the high-end.

Now once again the technology sands have shifted beneath our feet and iSCSI — mostly riding the "powers of 10" increments that Ethernet provides (going from 100M to 1G to 10Gbps) — is now challenging Fibre Channel in the area of performance, and typically beating it when it comes to price.

Already I see a number of sites running iSCSI SANs at the same sites that house their Fibre Channel ones, and device vendors adding iSCSI connectivity to their high-end offerings.

At the same time, market pressure is nudging down the price of Fibre Channel. Increasingly, decisions about SAN technology are being made along financial lines rather than just being driven by what technology is available. So at last the battle is on.

Who will win? That may turn out to be irrelevant, and not just because there is plenty of business out there for both sides of the war. New SAN technology, one that requires no switches, is beginning to appear. As switches often represent a substantial part of the SAN environment, this approach offers the potential to seriously reduce the cost-per-gigabyte of SAN storage.

Small versions of a switch-less SAN are available in consumer products. In fact, I am running one now. Don't be put off by that fact that this has such "humble" market beginnings, however.

Remember that PCs once started out at the bottom of the computing totem pole, but within a few years grew in power to the point where they were able to knock off all those expensive RISC-based engineering workstations where we once did all our CAD and engineering work.

Remember products from companies with names like Ardent, ComputerVision, Dana, HP, SGI, Stardent, Sun, and my old favorite, Lundy? Perhaps not, but no matter. The point is that once these powerful PCs were the answer to 99% of the market's needs and once the software vendors caught on to that fact, for most of these vendors it was bye-bye.

If the scalability is what the vendors claim it to be for these switch-less products, and if the performance scales as well, this will prove to be a truly disruptive technology. These are, of course, important "ifs", but keep an eye out for this. I sure am.

Karp is senior analyst with Enterprise Management Associates. He can be reached at mkarp@enterprisemanagement.com

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E-MAIL NEWSLETTER SHOWCASE: WEB OPTIMIZATION

Using QoS for WAN optimization

BY DENISE DUBIE

With all the new IP applications traversing wide-area networks, industry experts speculate that past QoS measures need to be balanced against WAN optimization and application acceleration technologies.

According to a research report by Forrester Research analyst Robert Whiteley, QoS efforts aren't so simple when it comes to ensuring the performance of IP-based applications over the WAN. With advanced traffic, such as multimedia applications crossing the lines, previous efforts at QoS could be foiled, the report says.

"QoS is a necessary — and often evil — component for multi-service networks. Its goal is to guarantee that not all traffic is treated equally," Whiteley states. "It's important to note that QoS is not a technology, but rather an attribute of your network defined across many technologies like routers, switches, and appliances."

He details how QoS helps network managers first mark traffic by classes of service and then shape traffic based on available bandwidth. A QoS-enabled network puts traffic into various buckets that represent classes of service (CoS). This involves distinguishing traffic that gets top priority down to that traffic with less importance, based on business needs or pre-set policies. Whiteley says when it comes to differentiating traffic, network managers need to be sure not to get too detailed because doing that makes QoS "exponentially harder to administer."

Secondly, traffic shaping works with the pre-set buckets, or classes, of traffic to "throttle back excess packets" and "prevent one particular class from hogging" bandwidth. The main difference between CoS and shaping is the more dynamic nature of traffic-shaping technologies, from vendors such as Packeteer, which provide products to help address bursting traffic loads.

QoS requires ongoing maintenance and attention, Whiteley says. "Every time a company adds a new enterprise app, touches a significant network component, or adds and subtracts nodes — QoS must be revisited. Similar to any network policy, it has to be treated as an ongoing project subject to audits and regular refreshes."

Whiteley advises that if companies cannot eliminate QoS in their networks they should opt to have it performed by a service provider as a managed service. He explains that applications often perform worst on the WAN, so there isn't as pressing a need to implement QoS on the LAN.

"To mitigate the WAN complexity, Forrester recommends managed service providers such as AT&T and MCI," Whiteley says. ■

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Campus creates a collaborative IT culture

University of Md., Baltimore CIO Peter Murray discusses how he achieved that goal.

When Peter Murray arrived as the new CIO for the University of Maryland, Baltimore four years ago, he was faced with a daunting set of enterprisewide IT projects that were just getting underway.

There was no formal structure for effectively organizing and deploying these projects across the UMB campus's numerous IT groups, which included a 250-person central IT organization as well as local IT units in the university's schools and departments, the highly regarded medical center and an affiliated organization of doctors.

Network World Senior Editor John Cox talked with Murray to find out how he made collaboration possible. What follows is an edited transcript of the conversation.

Network World: Why did the university need some kind of special effort for IT collaboration?

Peter Murray: It's not that collaboration did not occur before I arrived. We just took it to another level, a more formal level.

It was recognized that the response to [enterprise IT] issues was disjointed; it was difficult to bring the key IT activities together, define them in common plans and make them work across the various campus organizations.

NWW: What's a concrete example of the problems you encountered?

Murray: One of the first questions I got when I arrived was "what e-mail system do you want to use?" And I said, "What do you mean?" There were 21 separate, disparate e-mail systems in operation at UMB. One of the first things I did was to create a task force to tie together these systems so users could have a global address list to find anyone in the system and send them an e-mail and be certain it got to that recipient.

NWW: You refined this approach in coordinating the various help desks around campus, correct?

Murray: There was no campuswide help desk. Various organizations had their own. I created the first campus help desk, hired people to staff it and found a space for them. Then we organized formal meetings of a task force composed of people from the various local help desks.

The university's School of Medicine was using help desk software Remedy. We just added some more software licenses to that for the campuswide desk. Through Remedy, we collect data on what are the most common questions and problems and address them. For example, we knew we were getting a lot of questions about the Apple Macintosh. So we spun off a Mac users group. We realized we could use this same approach for other IT initiatives.

NWW: How did you flesh out this approach to collaboration?

Murray: What I did was to create formal structures for collaboration (see graphic). We had the IT Steering Committee already in place, but I changed the whole composition. Originally it was mostly administrative and technical people. And it wasn't really focused on major IT goals, objectives and action.

I invited faculty and non-IT staff, each one able to represent their specific area or department. Now the Steering Committee touches everyone on the campus. It meets quarterly and we talk about updates to the overall IT [strategic] plan, what's been done to meet plan objectives, and new issues that are emerging. There's a yearly review of the entire IT plan, deciding what are the key IT issues, priorities and action items.

NWW:: How are these action items actually tackled in this new model?

Murray: In a group of offshoot committees or task forces. The Steering Committee is in the center, like a hub. Task forces are like spokes from the hub, each one based on a separate priority. For something like campuswide wireless or IT security, we create a task force that brings together experts drawn from all the groups on campus to work the actual project.

NWW: Do the various local IT groups, for the schools such as medicine or nursing, still have their own funding and planning?

Murray: These IT leaders typically are associate deans reporting to the dean of their respective schools. There are so many activities that happen in a school or other organization that it wouldn't really work if I had to make decisions on expenditures, for example, in all those areas.

NWW: You applied this new approach in a security task force. What happened?

Murray: At first they had a hard time with this new concept of collaboration. Their initial discussions weren't very productive. They struggled with the language of the draft policies, with who should write what, and how. But once they had the first one or two drafts of the policy completed, it really picked up speed.

NWW: Why? What changed?

Murray: They were creating a core group of security liaisons, who now stay in touch all the time, both inside and outside the task force. They were working together effectively both on operational issues, such as installing a new release of Microsoft Windows patches or a looming virus threat, and on strategic issues, such as introducing a new IT security technology.

NWW: Did this shift to a collaborative IT model lead to savings or downsizing?

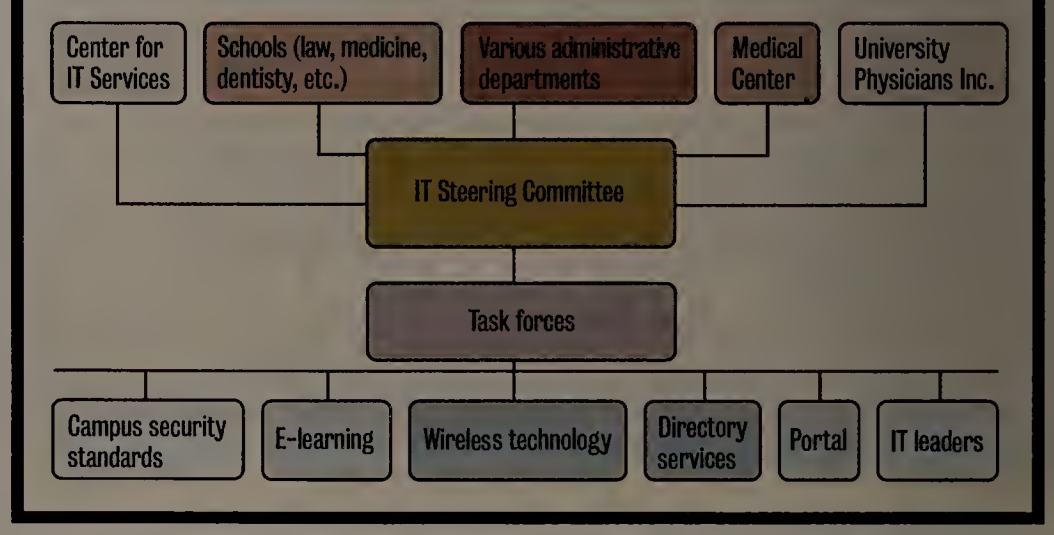
Murray: We have had some savings, but I'm not comfortable trying to come up with a single dollar amount across all the organizations. What we did achieve often was cost avoidance. We redefined IT responsibilities, moving some to central IT, and freeing up more time and resources for the local IT departments at the various schools or other campus organizations to concentrate on their specific user constituencies. In some departments, this was very significant.

NWW: How will you apply this connected collaborative model going forward?

Murray: We have some big projects. One is a "preaward system" for our researchers: Faculty will be able to create and route research proposals to various funding agencies. We'll be expanding our [human resources] self-service capabilities through the Web. We're just starting to implement unified messaging, so each user can have voice and e-mail messages on their computers or IP-enabled phones. ■

Steering commitee structure

The University of Maryland Baltimore's IT steering committee draws members (both IT and non-IT) from various groups to set universitywide priorities within a strategic plan. It creates task forces to craft details for projects affecting the entire university.



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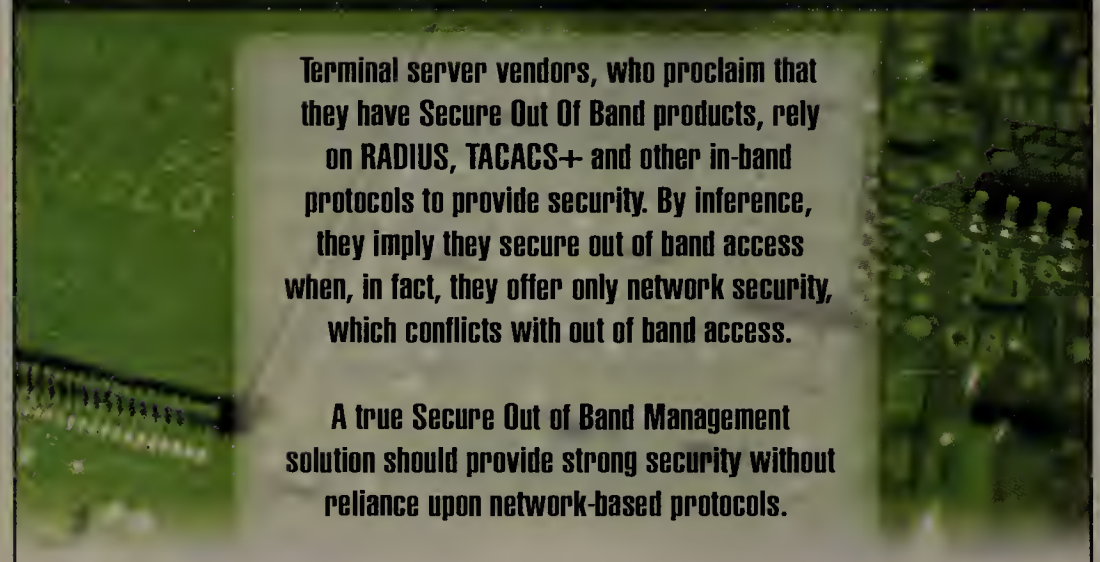

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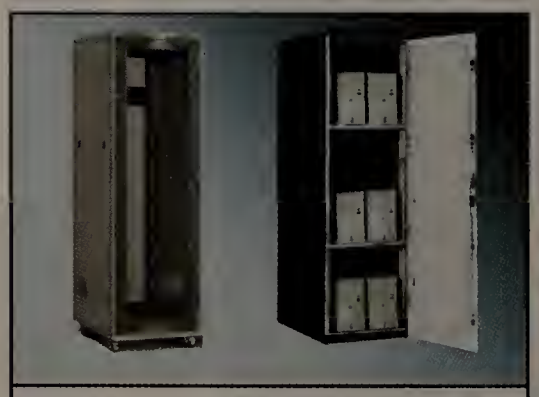

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Chambers

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Cisco. They actually pushed us to move dramatically faster in the application area. So it's moved from a transport mentality to something they want dramatically more out of in a shorter time period, and at the same time how do they control the costs with it.

What's your take on how significant a competitor Juniper is in the enterprise?

We do not set our strategy around what our competitors do. We try to get the market transitions right and we listen to what the customers like. And then we listen to what the customers like about our competitors or not. But we try to get the market transitions right. So within the enterprise, if we're right on data/voice/video convergence, the role security will play in that, switching combining with routing and the other elements, then for companies who come at us with a product or two it will be very challenging. Many of the companies waited too long. A lot was written two years ago about how effective some companies would be in the enterprise marketplace. [Juniper] announced their access router way ahead of us. We have had tremendous success in the access routing segment where they have not. It's hard to move into new markets

In each of our product areas, there's a different No. 1, 2 or 3 potential competitor. We made a decision five years ago plus that we felt that the [network markets] would blur. None of our peers followed that. If we're right on that, it's going to be really difficult for them to meet us.

So would it be fair to say you consider Juniper a point product competitor but not a strategic competitor?

It would be fair to say that most of the players in the industry are primarily point product competitors, and their ability to move beyond one or two products has not occurred. We'll see how that goes moving forward. Alcatel has taken an interesting approach in that they're going to be the systems integrators. We'll see how the market plays out. But it's hard to become a leader in more than one product area.

A fair amount of your marketing right now is targeted to business executives. Isn't this a critical time, with all of the initiatives under way, to be talking more to the IT person than to the business person who probably doesn't understand these concepts?

No. Because a lot of CIOs, directly or indirectly, ask you to help them understand what this can mean to the business and why Cisco brings a unique [perspective]. So if you believe that business strategy would, at a minimum, be enabled by networked IT — and I am now beginning to believe that networked IT may actually change business strategy — you've got to educate the business user on what is capable and get them to understand that when you think about a Cisco IP phone, you aren't just thinking about replacement of your prior phone. You're thinking about integrated data, voice and video. You're thinking also about total cost of ownership. You're talking about flexibility in communications, about how you communicate among yourselves, with your peers. You're thinking architecture. So you want them to think of us in that way, whether it's the CFO who has to approve us for a 20% price premium vs. XYZ company or the business leader who has to choose between adding 200 sales reps or another physical branch to spending money on the network. Same thing with the data center. We're sending messages both to the CIO but also, with our usual humor, to the CEO that Cisco's very uniquely positioned to provide security. It's the balance of the two messages. ■

Group policy vendors adding better control to their wares

BY JOHN FONTANA

Desktop and server management vendor Special Operations Software this week plans to release an extension to Microsoft's Group Policy technology that lets administrators tighten network security by controlling the strength of passwords assigned to individuals or groups of users.

Another vendor, DesktopStandard, says later this year it will ship two extensions to Group Policy for change management that focus on software deployment and inventory.

Microsoft's Group Policy, which is supported on Windows 2000, XP and Windows Server 2003, lets administrators centrally manage, customize and lock desktop and server settings based on a set of policies maintained in the directory. Administrators can do anything from tuning security settings to preventing end users from making changes to their desktops.

"There is a lot you can do because an object exists in a directory," says Scott Crawford, an analyst with Enterprise Management Associates. "In principal, any object in a directory can be given any attributes that you want to give it. Group Policy is taking more advantage of the capabilities that Active Directory has to offer."

With Specops Password Policy, Special Operations is eliminating the limitation in Active Directory requiring that the same password policies apply to every user in a domain. That means all users adhere to the same rules on how a password is constructed, such as requiring the use of numbers and letters, and on what cycle it must be changed.

Password Policy gives administrators the ability to apply password policies based on group membership, organizational unit and individual user accounts. CEO and IT administrators managing many systems can have a very complex password construction that is difficult to hack, while regular end users can have something that is easier to remember but potentially less secure. Password Policy also extends the options for constructing a complex password and defines the complexity rules a password must meet.

The software requires the installation of a Dynamic Link Library on a Microsoft domain controller, which is used to run Active Directory, to support the password extension. It also includes a snap-in for the Microsoft Management Console and an option to install client software that displays a dialog box on a user desktop with an explanation on how to construct a password.

Special Operations plans to follow Password Policy, which is priced at $1,200 per domain and $3 per user, with another Group Policy extension called Specops Inventory, which will ship in March. The extension is focused on asset management.

Rival DesktopStandard also plans to ship a new product in its PolicyMaker line of Group Policy extensions called Change Management that focuses on software deployment and inventory.

"Microsoft's Group Policy system offers deployment natively but it is limited," says Eric Voskuil, CTO of DesktopStandard.

Change Management will include options for scheduling and bandwidth throttling in the deployment extension. The inventory tool will tie in with DesktopStandard's Dragnet reporting tool to collect inventory data from network desktops and servers. The company also plans to integrate its Dragnet reporting software with all the extensions in its PolicyMaker lineup and those offered natively from Microsoft.

Pricing for Change Management has not been announced. ■

Policy makers

Special Operations Software and DesktopStandard are adding to their wares for providing extensions to Microsoft's Group Policy management technology, which is part of Active Directory.

Vendor	Software	Description	Available
Special Operations Software	Specops Password Policy.	Allows for multiple password configurations per Active Directory domain.	Now
DesktopStandard	PolicyMaker Change Management	Three extensions to group policy: software deployment, update and inventory.	First half of 2006

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BACKSPIN Mark Gibbs

Mistakes and annoyances

Last week I screwed up when I cited problems Bill Gates had with an onstage demo at the International Consumer Electronics Show. Turns out that happened in 2005, not at the recent CES. As I now understand it, Gates' latest demo went off without a hitch. My apologies. I'll beat myself with a wet copy of *Network World* as soon as I stop typing.

I do, however, stand by the main contention of that original piece: that the digital lifestyle will remain fabulously irrelevant until it can deliver something other than ever-more-exotic and less reliable ways to consume the same old content. I've had some interesting responses to the topic that we'll discuss in a future column.

This week I want to examine being annoying online. On Jan. 5 President Bush signed into law the Violence Against Women and Department of Justice Reauthorization Act. This admirable bill has become the focus of much commentary because of a single provision that can be creatively interpreted as making it illegal to use the Internet to be anonymously annoying.

Various pundits and columnists who shall remain nameless jumped on this bill with wild abandon, but alas for these journalists, it seems that this interpretation was not at all accurate.

The anonymous-harassment provision is part of a statute that I understand was part of the Communications Act of 1934 and intended to address the problem of crank calling (feel free to correct me if I have been misled). This provision was modified to include new communications technologies for the Communications Decency Act, so the issue of online annoyance is already covered, and the provision in the Violence Against Women Act is simply redundant.

But the idea of being able to sue someone for being annoying online is interesting. Whom would we go after?

First, there are the owners of badly designed commercial Web sites — they're annoying. Consider Cingular: If you (like me) were an AT&T Wireless victim, er, customer, and you and your family tried to upgrade your cell phones on the Cingular Web site, it would send you to log on to the shattered remains of the AT&T site. There you would answer questions only to have it tell you that because you have multiple lines, you have to go to a Cingular dealer or call its customer disservice department. That's really annoying.

How about people who send badly written e-mail? The folks whose caps lock key appears to be stuck or who have never heard of a spell-checker or who use weird fonts in bizarre colors against hideous backgrounds?

Or how about the new spammers, the politicians? Recently Charlie Crist, Florida's attorney general, got lots of positive press over his aggressive anti-spam laws, which mandate a $500 fine for every e-mail a violator sends. But now that Crist is running for governor, he seems to think he can send out unsolicited e-mail and, because he's a politician, it isn't spam. In December Crist e-mailed tens of thousands of state residents to promote his candidacy and solicit donations for his campaign.

Recipients who tried to unsubscribe found they couldn't do it. According to a Reuters story, Vivian Myrtetus, a spokeswoman for Crist's gubernatorial campaign, said, "This is not spam. This is truthful, it's straightforward. We're honest. To be spam it has to be, under Florida law, defined as being deceptive. The attorney general does not consider this spam and is, as you know, at the forefront of protecting citizens against that."

Crist isn't the only political spammer out there, and it is just going to get worse.

I was going to list a few more annoyances, but the problem is we'll never have a nice tidy Internet. It will always be messy, chaotic and dynamic, and it is all the better for it. Anyway, if being annoying online were punishable, I wouldn't be writing this column.

Annoy me at backspin@gibbs.com.

NETBUZZ News, insights and oddities

Did you hear who's been in Redmond?

Paul McNamara

Internet-driven rumors can be a hoot — unless, of course, you're the one caught under the wheels. Thanks to tools such as Technorati and Google News, today it's possible to actually watch a whopper unfold over the course of a few days.

Perhaps you too caught this giggler last week: Steve Ballmer is soon to be out as CEO of Microsoft — and his replacement will be a certain former president of the United States. . . . No, it's not Gerald Ford.

William Jefferson Clinton has been spotted at Microsoft headquarters multiple times in recent months "and has been interviewing for the top slot as the company looks at ways to transform themselves for the future," Andy Abramson wrote Jan. 6 on his blog called "VoIP Watch," a platform that has helped gain Abramson enough notoriety as a VoIP expert/pundit to be quoted in *The Wall Street Journal*, *Financial Times* and *San Jose Mercury News*, among a host of other media outlets. Abramson also co-hosts with Ken Rutkowski the daily World Tech Round Up on KenRadio.com, billed as "the Internet's longest-running technology news broadcast" and the forum where this rumor first took flight.

As you might expect, the Clinton-for-Ballmer speculation shot around the blog vine like the latest on Nick and Jessica (both of whom are said to be in line for key jobs in Redmond once Ballmer bails and Clinton takes over, I am told). A mention of the Clinton rumor in the *Mercury News*' widely read "Good Morning Silicon Valley" newsletter guaranteed that this one would have gums a-flappin' far and wide.

So I had to call Abramson to find out if he was serious, fully believing he'd tell me that "the rumor" was half idle speculation, half lighthearted radio schtick.

Here's what I got instead: "They want him and he wants to be there."

Don't ask me how I managed not to laugh.

Now to be fair, Abramson also allows that his sources speculate that Microsoft may be wooing Clinton to join its board of directors, or that Bill C. and Bill G. could be putting their heads together on one of their respective philanthropic efforts (ding, ding, ding). Yet Abramson assures me that his reporting of the juiciest prospect — Ballmer out, Clinton in — has elicited largely thoughtful replies from listeners, readers and other bloggers — including some within Microsoft: "No one has said, 'What kind of pipe are you smoking?'"

Allow me to be first then: What *is* in that pipe, Andy?

No matter what they may be mumbling around water coolers in Redmond, there is no more chance of Bill Clinton becoming CEO of Microsoft than there is of me catching Jessica on the rebound. Never say never? Nonsense! Never, never, never.

I could cite a hundred good reasons why this Clinton fantasy is inconceivable, but doing so might give the impression that I consider the matter an open question. Suffice to say that ex-presidents do not trundle back to the private sector hat in hand. It's undignified, even for an ex-president who in the past has seemed not to understand the meaning of that word.

None of which is to say that the what-ifs aren't great sport.

Example: A close friend of mine writes about business for a metropolitan daily newspaper. We're both political junkies, so last week we found ourselves debating via e-mail whether Bill Clinton being on the Microsoft board would help or hurt Hillary Clinton's expected White House run (even though neither of us puts a penny's worth of stock in the rumor). My friend said it would help, by bolstering Hillary's pro-business credentials. I said it would hurt, because carrying Bill C.'s baggage out on the campaign trail will be challenge enough without Hillary also having to lug Bill G.'s.

Work time well spent? . . . You decide.

All rumors are always welcome here. The address is buzz@nww.com.

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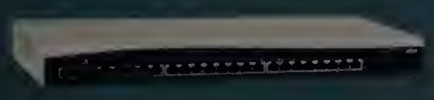

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